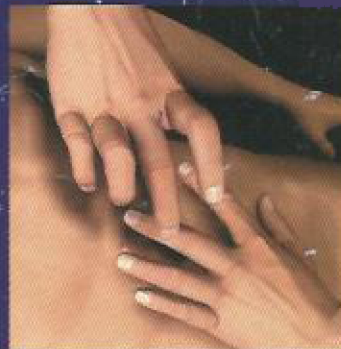
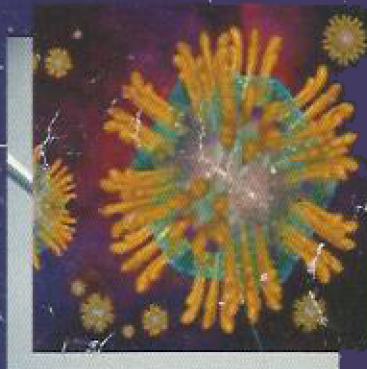
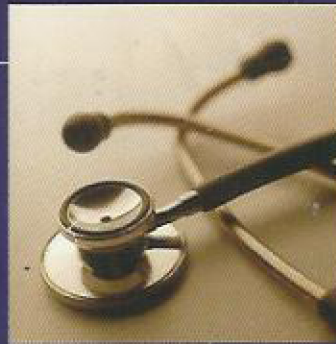
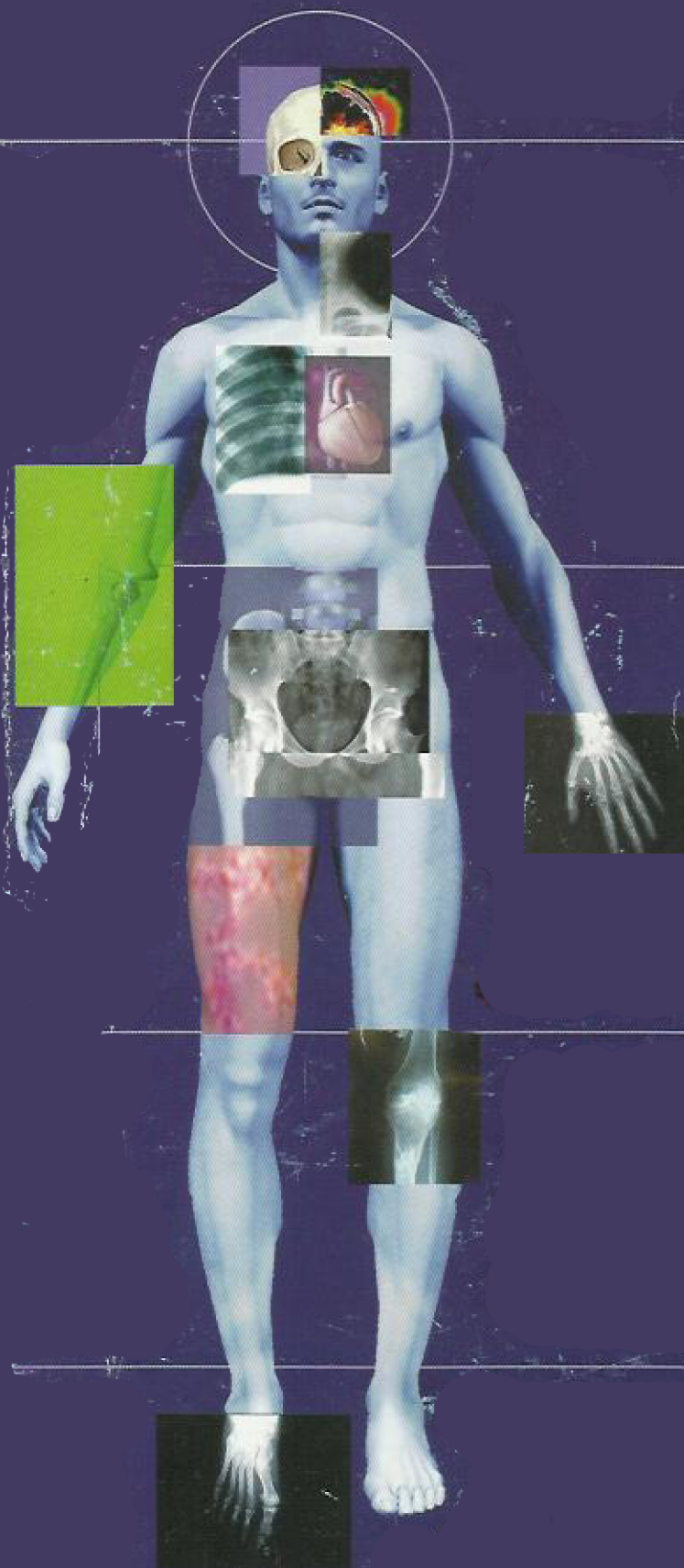


ESSENTIALS OF CLINICAL MEDICINE

PROF. DR. MAGDY ISHAK



12th EDITION

White Knight Love

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طلبات الكتب
أو للمراسلات أو الاستفسارات

أ.د. مجدى إسحق عطا الله

إستشارى الأمراض الباطنة والأعصاب

زميل الكلية الملكية الطبية الكندية

أستاذ بكلية الطب - قصر العيني - جامعة القاهرة

٠١٢٥٧٦٦١٩٩ - ٣٧٤٨٥٧٥١



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لا تمنع الخير عن اهله مادام في طاعة يدك ان تفعله
الذي يزرعوه بالدموع يحصدوه بالابتهاج

1

HISTORY TAKING

VITAL SIGNS

GENERAL EXAMINATION



History taking	2
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HISTORY TAKING

I-Personal History

Write personal history in a single paragraph

1-Name : to be familiar with patient

2-Age :

- young age : congenital
- old age : atherosclerosis

3-Sex :

- males : coronary heart disease (M. to F. 4 : 1)
- female : collagen diseases e.g. SLE (F. to M. 10 : 1)

4-Occupation : dusty worker (pneumoconiosis)

5-Marital status : single, married, divorced, widower, widow - *number & age of children*

6-Residence : endemic areas for parasitic diseases

7-Special habits of medical importance :

a-Smoking : smoking index = N° of cigarettes/day $\times$ years

> 100 mild > 200 moderate

> 400 chronic heavy smoker i.e. 20 cig / day $\times$ 20 years

b-Others : alcohol, cannabis (hashish), morphine, heroin, drugs

8-Handedness :

- To determine *dominant* hemisphere in neurological diseases
- If dominant hemisphere is affected, *aphasia* occurs

Hazards of Smoking

1-CVS : -heart : ischemia - hypertension - arrhythmia

-vascular : atherosclerosis - thrombophlebitis - Buerger's disease

2-Respiratory : COPD, br. carcinoma - lip cancer (in pipe), glossitis, pharyngitis, laryngitis

3-GIT : esophageal & gastric CA - peptic ulcer - irritable bowel syndrome

4-Fetus : $\uparrow$ perinatal mortality, restricted fetal growth

5-Miscellaneous : urinary & prostatic carcinoma - tobacco amblyopia

II-Complaint

1-Do not use medical terms : in the patient onwards

2-As short as possible : most important 1 - if > 1 complaint $\Rightarrow$ choose 1 & mention all complaints

3-Duration of complaint : may be postponed to present history

III-History of Present illness

"Present History"

1-Use medical terms

2-Detailed analysis of complaint :

- onset : acute - gradual - insidious
- course : progressive - regressive - stationary - fluctuating
- duration
- related symptoms
- related investigations
- related medications & its effect

3-Leading questions for other complaints : according to every sheet

⌘ Arrangement

- Analysis of complaint
- Positive data : *in chronological order*
- Negative data are mentioned as well

IV-Past History

1-Diseases : when ? investigations ? recurrence ? ttt ? *special care for :*

- a-CVS : hypertension, coronary HD
- b-GIT : jaundice
- c-Endocrine : DM
- d-Fevers : Rh. fever, tonsillitis
- e-Parasites : Bilharziasis

2-Trauma, accidents : coma ?

3-Operations & blood transfusion

4-Drug intake : types & duration

V-Family History

1-Similar condition in family : genetic or environmental factor

2-Positive consanguinity

3-Common diseases : DM, hypertension, coronary heart disease

⌘ *In negative cases ⇒ irrelevant FH "of no clinical significance"*

VITAL SIGNS

1-TEMPERATURE

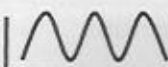
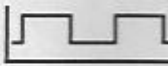
a-Normal body temperature :

- Oral 36.5 - 37.2 °C : place thermometer after shaking & sterilization under tongue for 3 min.
- Fever : > 37.2°C -Subnormal T. : < 36.5°C
- Axillary : add 1/2 °C -Rectal (cor temp.) : subtract 1/2
- Fahrenheit °F : (°C × 9/5) + 32
- Normal diurnal variation < 1°C : lowest in early morning reaching peak in afternoon

b-Pulse : temperature ratio

- 1-Every rise of body temp by 1°C ↑ pulse by 10 - 15 beats
- 2-Higher pulse rate for pyrexia "*relative tachycardia*" : carditis (rheumatic, diphtheritic)
- 3-Slower pulse rate for a given pyrexia "*relative bradycardia*" :
 - Typhoid fever -Viral infection
 - Meningitis -Ascending cholangitis in obstructive jaundice "Charcot's fever"

c-Types of fevers (pyrexia) :

Types	Description		Example
1-Continuous	Temp. does not reach base line & daily fluctuations do not exceed 1°C		Typhoid
2-Remittent	Temp. does not reach base line & fluctuations are > 1°C		-Empyema -Pus under tension
3-Intermittent or hectic	Temp. reaches base line for some hrs & fluctuations are > 1°C		Benign tertian malaria
4-Relapsing	Fever for few days with interval of normal T. for few days in between		Brucellosis, Hodgkin's disease
5-Low grade	Prolonged fever < 38.5 °c, not responding to ordinary ttt		Malignancy
6-Hyperpyrexia	> 41.1°C Heat stroke, encephalitis, pontine hemorrhage, status epilepticus, thyrotoxic crisis		
7-Hypothermia	< 35 °C Old age, shock, myxedema, starvation, phenothiazine, damage of ant.hypothalamus		

⌘ Indications to measure Temp. PR

- 1-Child 2-Coma 3-Convulsion 4-Dyspnea & mouth breather 5-TB
6-Difficulty : painful mouth disease, insane, trismus of jaw, severe vomiting

2-RESPIRATORY RATE

1-Rate :

- Normal 12-20 /min (pulse : resp. ratio 4 : 1) - count rate while holding pt. wrist (distract his attention)
- ↑ rate = tachypnea : causes of acute dyspnea & fever -↓ rate = bradypnea : RC inhibition (morphine)

2-Rhythm - type : see chest

3-PULSE

EXAMINE "Feel":

- 2 **radials** : classically palpable artery being superficial & against bone use middle 3 fingers, with semi-pronated patient hand to avoid stretch of brachial artery by fascia in cubital fossa



palpating radial pulse

-2 carotids :

- Anterior to sternomastoid at angle of jaw
- Patient should lie down to avoid vaso vagal attack in over sensitive carotid sinus
- Auscultate a. first esp. in old with atherosclerosis & TIA



palpating carotid pulse

-2 subclavians :

- from behind by pressing downwards with 4 fingers above middle of clavicle (1st part of a.)
- from front by below junction of middle & lateral 1/3 of clavicle (3rd part)

-2 brachials : felt at elbow medial to biceps tendon

-2 femorals : mid inguinal point while thigh is flexed & abducted

-2 popliteals : in popliteal fossa while patient in supine position with slight flexion of knee

-2 post tibials : behind medial malleolus

-2 dorsalis pedis : lateral to tendon of extensor hallucis longus

COMMENT : 12

1-Rate :

- Normal 60 - 100 beats / min
- < 60 bradycardia : myxedema - heart block - SB
- > 100 tachycardia : thyrotoxicosis - ST - PSVT - AF

2-Rhythm :

- Normal : regular
- Irregular : -marked (irregular) irregularity (can't count 4 regular beats) = AF
- occasional irregularity (can count 4 beats) = multiple premature beats

Pulsus deficit : done in irregular pulse

- Definition : apical pulse rate (as detected by counting S1 by stethoscope) > radial pulse
- Cause : ventricular contraction opening cusp without peripheral transmission of blood
- In AF : pulsus deficit > 10 beats / min. -in extrasystoles : < 10 beats / min.

	A.F.	Multiple PMBs
Rate	rapid 120 - 150 / min. - rare slow AF	normal
Rhythm	no 4 regular beats	4 regular beats
Pulsus deficit	> 10 / min.	< 10 / min.
Exercise	↑ irregularity	↓ irregularity
JVP	absent a wave	normal - occasional irregularity
ECG	absent a wave - irregular QRS	early QRS complex followed by pause

3-Force ⇒ systolic BP : minimal pressure needed to occlude arterial pulsation

4-Tension ⇒ diastolic BP : minimal pressure needed to feel arterial pulsation

5-Volume ⇒ pulse pressure (S-D) = degree of expansion { small PP < 30 - big PP > 60 mmHg }

Causes of small volume (weak pulse) = narrow PP = low CO

- 1-↓ Filling : pericardial effusion, constrictive pericarditis
- 2-↓ Pumping : shock, HF, myocardial infarction
- 3-Obstruction : AS, MS, pulmonary hypertension

Causes of big volume (wide PP) = prominent arterial pulsation = causes of hyperdynamic circulation :

- 1-AR, atherosclerosis, anemia, AV fistulae
- 2-Beri Beri, block of heart, bradycardia, Paget disease, pregnancy, ↑ BP (hypertension)
- 3-Thyrotoxicosis

Causes of variable volume :

- 1-Arrhythmia : AF, multiple extrasystoles
- 2-Pulsus alternans lvf
- 3-Variable partial heart block

6-Special characters : normal pulse ⇒ no special character

a-Water hammer pulse : collapsing - big PP

-Definition : sudden ascent, sudden descent, big amplitude
best elicited by raising patient arm high (to ↓ diastole)
while palpating forearm by palm

-Causes : of big volume esp. AR



b-Plateau pulse : pulsus tardus

-Definition : slow ascent, slow descent, small amplitude

-Cause : AS



c-Pulsus Bisferiens : 2 up beats

-Definition : pulse with 2 palpable systolic peaks - better felt on carotid with thumb
1st peak : percussion wave of ventricular systole transmitted
through closed aortic valve to aortic blood flow

2nd peak : delayed ejection of blood through stenotic aortic valve

-Causes : double aorta (AR + AS) - idiopathic hypertrophic subaortic stenosis



d-Pulsus alternans :

-Definition : normal, followed by weak beat with equidistance (regular heart)

-Cause : LV strain (early failure)

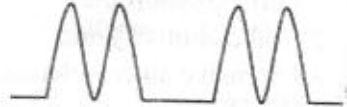
-Detected in severe cases by finger palpation (difference 20 mmHg)

In mild case detected by sphygmomanometer. Initially only normal beats are heard, but when pressure is lowered, HR is doubled

**e-Pulsus bigeminus or trigeminus = extrasystoles**

-Definition : palpation of 2 or 3 beats, followed by a pause

-Causes : digitalis toxicity - hypokalemia - myocardial infarction

**f-Pulsus paradoxus :**

-Definition : $\downarrow$ pulse volume (due to $\downarrow$ systolic BP > 10 mm Hg) with deep inspiration

-Causes :

1-Normal (physiological) : but < 10 mm Hg

2-Cardiac tamponade : pericardial effusion & constrictive pericarditis

3-Obstructive lung disease : COPD, status asthmaticus

4-Massive pulmonary embolism

5-Severe congestive HF

-How to detect pulsus paradoxus ?

1-By palpation (in severe cases)

2-By sphygmomanometer (in border line cases)

7-Condition of vessel wall :

-Normally not felt

-Felt thickened (cord like) in arteriosclerosis & (beaded) in polyarteritis nodosa

8-Equality on both side :

Both radial arteries should be palpated at the same time

Causes of unequal pulse volume

1-Lumen : thrombosis, embolism

2-Wall : -aneurysm of aortic arch -dissecting aneurysm of aorta
-arteritis -atypical coarctation of aorta involving left subclavian

3-Pressure : cervical rib, Pancoast tumor

9-Radiofemoral delay : femoral artery is weaker & delayed in coarctation of aorta

10-Pistol shot : heard over femoral artery in AR

11-Capillary pulsation : seen in nail bed in AR



12-Peripheral pulsation :

- in head & neck : carotids, facial, superficial temporal a.
- in UL : radial, brachial, axillary
- in LL : femoral, popliteal, posterior tibial, dorsalis pedis
- dorsalis pedis : may be absent as normal variant in 15%

Absent or ↓ peripheral pulsation in :

- 1-Leriche syndrome
- 2-Coarctation of aorta
- 3-Extensive atherosclerosis
- 4-Peripheral embolism
- 5-Thromboangitis obliterans

- LL edema
- COP



Examination of dorsalis pedis

4-BLOOD PRESSURE

DEFINITION :

- Systolic P. = pressure exerted by LV on arterial wall = a column of mercury of 120 mmHg
- Normal BP 140 / 90
- Grading of hypertension : according to diastolic BP ⇒
mild : 95 - 104 -moderate 105 - 114 -severe >115
- Hypotension : BP < 90 / 60

MEASUREMENT :

-Proper size of bag :

- width of bag should be 40 % of limb circumference
- length of bag should be 80 % of limb circumference
- using normal cuff in obese gives false diagnosis of hypertension

-Palpatory method :

- to avoid auscultatory gap
- used for systolic BP only
- less accurate

-Auscultatory method :

- for systolic & diastolic BP
- BP should be taken in Rt & Lt arms : normally may be a difference in P. of 5 - 10 mm Hg - subsequent reading should be made on arm with higher pressure.
- if difference > 15 mm Hg ⇒ same causes of unequal pulse



measuring BP

Technique of BP measurement

- 1-Patient should rest for 5 -10 min before measurement - sitting or supine position is acceptable
- 2-Arm should be at level of heart + cuff 3 - 5 cm above cubital fossa " *تقرع العوا*
- 3-Arm should be supported (avoid isometric exercise which $\uparrow$ BP)
- 4-Avoid venous congestion from tight clothing or incomplete deflation from previous measurement
- 5-Raise pressure until brachial pulse is obliterated - this avoid auscultatory gap .
- 6-Slow deflation (2 mm / sec.) is essential to avoid error
- 7-The observer eye should be at level of mercury meniscus to overcome parallax error
- 8-BP is measured in sitting & recumbent position for postural hypotension (difference of systolic BP between both > 20 mmHg)

SPECIAL NOTES :

- 1-BP in LL is measured by application of special large cuff around lower 1/3 of thigh & auscultation of popliteal artery (in popliteal fossa) while patient lies in prone position.
- 2-Normally systolic BP of LL is > than UL by 10-20 mmHg due to :
 a-Arteries of LL in direct continuity with aorta b-LL ms are more bulky c-Effect of gravity
- 3-In aortic regurge systolic BP in LL is > than UL by 60 mmHg (exaggerated normal criteria - Hill's sign)
- 4-In coarctation of aorta systolic LL BP is < than LL (opposite normal criteria - reversed Hill's)
- 5-If P. Pressure is > 60 , diastolic BP < 60 then :
 -diagnose AR & search for its peripheral sign (e.g. pistol shot)
 -large pulse volume & water hammer pulse
 -epigastric pulse coming from aorta

SOUNDS "Korotkoff "

Phase I <i>sounds appear</i>	120	<i>Systolic BP</i>
Phase II <i>sounds muffle</i>	110	
Phase III <i>sounds sharps</i>	100	
Phase IV <i>sounds muffle</i>	90	
Phase V <i>sounds disappear</i>	80	<i>Diastolic BP</i>

-Diastolic P. :

- Stage V : point of disappearance of sounds is the diastolic BP
- Stage IV : muffling - It is recorded as diastole in high CO (children, pregnant, AR, thyrotoxic)

Uses of Sphygmomanometer

- 1-Record BP + staging of hypertension (mild - moderate - severe)
- 2-Closed venesection : in HF, hypertensive encephalopathy
- 3-Secure hemostasis
- 4-Detect pulsus alternans
- 5-Detect pulsus paradoxus
- 6-Lowenberg's cuff sign : elicit pain in DVT
- 7-Hess test : elicit ↑ capillary fragility in purpura
- 8-Trousseau sign : elicit carpopedal spasm in latent tetany
- 9-Walker's test : elicit ptosis in myasthenia gravis

GENERAL EXAMINATION**I-GENERAL OBSERVATION**

1-MENTALITY : see neurological sheet

2-BODY BUILD: balanced relation between age, sex, height & weight

Weight :**-Causes of obesity :**

- 1-Simple obesity : genetic ob. gene -excess food with reduced activity - stress
- 2-2ndary obesity : Frohlich's syndrome - Cushing - myxedema - insulinoma

(Males/boys + obesity + ++ sexual development + disturbances of sleep and appetite)

-Causes of under weight :

- 1-Malnutrition & anemia
- 2-Endocrinal : Sheehan S., thyrotoxicosis, Addison's
- 3-Chronic parasitic infestation : Bilharziasis
- 4-Chronic fevers : TB, suppurative lung syndrome
- 5-End organ failure : liver F., renal F.
- 6-Malignant cachexia

Height :**-Causes of gigantism "tall stature" :**

- 1-Familial & racial : commonest
- 2-Excess GH : gigantism
- 3-Ennuchoidism "hypogonadism" : span longer than height
- 4-Marfan S. : tall, thin, lens subluxation, arachnodactyly "spider fingers", high arched palate, AR

-Causes of dwarfism "stunted growth" : see chapter 6

3-DECUBITUS : position preferred by patient in bed

History, vitals, general

Position	Condition
1-Normally	Patient is lying conformable (on back, sides) in bed
2-Sitting up	Bronchiectasis, massive ascites
3-Orthopneic	Semisitting, using high pillows in left sided failure
4-Tripopnea	Dyspnea on lying on one side - healthy side in lung abscess
5-Lateral decubitus	"on affected side" in lung abscess, pleural effusion, hepatitis
6-Prayer's position	Mediastinal syndrome : pericardial effusion, aortic aneurysm
7-Opithotonus	High arched back in tetanus, strychnine poisoning & meningitis
8-Squatting	Fallot's tetralogy (F4)
9-Prone	Pott's disease, gastroenteritis
10-Passive dorsal decubitus	In continuous high fever : patient lies helpless tends to slip down in bed, without effort to correct his posture
11-Rigid dorsal decubitus	In appendicitis & peritonitis - the patient lies helpless, little or no movement, flexing one or both hips

II-SKIN

A-TEXTURE

1-Elasticity:

- tense in scleroderma, edema
- loose in loss of weight, old age

2-Thickness:

- thick : acromegaly, myxedema, hyperkeratosis (Vit A. deficiency)
- atrophy : old, malnutrition, peripheral neuritis

3-Dry skin:

- dehydration
- myxedema
- vit A. deficiency

4-Excess sweating:

- fevers
- thyrotoxic
- TB
- nervous excitement

5-Striae:

- cushing → rubra
- obesity
- ascites
- pregnancy

B-COMPLEXION=COLOURS**1-Generalized Pigmentation**

- 1-Familial & racial
- 2-Excess ACTH "*MSH like action*" : in Addison's disease - pituitary Cushing, oat cell carcinoma
- 3-TB peritonitis
- 4-Pellagra
- 5-Hemochromatosis (Fe deposition)
- 6-Failure : renal F, liver F
- 7-Yellow colouration : see jaundice

2-Rash & Vascular Lesions

- Insect bites in exposed areas* - itchy & generalized
- Erythema marginatum*: in Rh. fever (major criteria)
- Cherry angioma*: "normal congenital anomaly" - bright red, 1-3 mm, no pulsation, do not fade on pressure present in trunk & extremities
- Spider naevi* : in liver cell failure (others : pregnancy, Vit B def., some normal individuals)
 - deep red, 1-3 mm, do not fade on pressure, present in whole body -
 - cause : purpura in SBE, hypersplenism, Leukemia
- Ecchymosis* : in hemophilia
 - reddish blue oval or irregular + central blood clot (SC flat nodules)
 - non pulsating, do not fade on pressure

*Spider Naevi***3-Pallor**

- Definition* : decrease visibility of oxy HB
- Detected in* :
 - face : inner side of lips, tongue (more accurate) - *not in conjunctiva*
 - palm of hand
- Causes* :
 - 1-↓ blood flow to superficial vessels : low CO, shock, syncope, HF, toxemia (SBE)
 - 2-Anemia
 - 3-Edema (mask colour of melanin & HB) : nephrotic syndrome
 - 4-Others : myxedema, lymphedema, albinism

C-HIRSUTISM

- Definition* : excess growth of hair in females taking male distribution
- Causes* :
 - 1-Familial, racial, idiopathic
 - 2-Ovarian tumors (virilizing) "*Stein-Leventhal syndrome*"
 - 3-Virilizing adrenal tumor
 - 4-Miscellaneous : TB, Cushing, drugs (minoxidil, steroids)

III-HEAD

1-Cranium "skull":

- Inspection : hydrocephalus, microcephaly, acromegaly, rickets
- Palpation : bone defects, bony bosses
- Percussion : cracked - pot sound in hydrocephalus "McEwen sign"
- Auscultation : systolic bruits in intracranial aneurysms

2-Face "appearance": healthy - or: *one jaw is larger than the other so infant & d*

- Acromegalic "ape like" : with prognathism, enlarged nose, lips, ears, coarse features
- Cushing "moon face" : with plethoric cheeks, hirsutism (moustache)
- Myxedema : apathetic, non pitting edema, dry skin, lost outer 1/3 of eye brow
- Emaciated : malnourished
- Thyrotoxic : starring look
- Toxic : infective endocarditis
- Rickets : square shaped

CNS facies :

- 1-Parkinsonism : mask face
- 2-Myopathic : muscle atrophy
- 3-Myasthenic : partial recurrent ptosis, squint
- 4-Nodular leprosy : leonine facies
- 5-Tetanus : risus sardonicus

(Abnormal grinning expression resulting from involuntary prolonged contraction of facial muscle)

IV- EYES

1-Eye brows : loss of outer 1/3 in myxedema, leprosy

2-Eye lids :

- Ptosis : *see neuro*
- Retraction : thyrotoxicosis (spasm of levator palpebrae superioris)
- Dark rings : insignificant - may follow lack of sleep, fatigue
- Puffy eye lids :
 - edema : all causes esp. nephrotic syndrome
 - ↑ venous pressure : HF - pericardial effusion - chronic cough as COPD (↑intrathoracic P.)

3-Eye balls :

- Exophthalmos: congenital - thyrotoxicosis - leukemic deposits - cavernous sinus thrombosis - A-V aneurysm
- Enophthalmos : congenital - general (dehydration, shock), Homer's syndrome
- Involuntary movement : nystagmus

4-Conjunctiva :

- Pallor
- Injected : conjunctivitis, hypercalcemia, polycythemia
- Hemorrhage : -hemorrhagic blood disease : SBE - purpura
 - ↑ ICT : severe cough e.g. whooping cough - severe hypertension
- Bitot spot : triangular white patch in Vit. A deficiency (Xerophthalmia)
- Edema (chemosis) : allergic, inflammation

5-Cornea :

- Keratomalacia : Vit A deficiency
- Vascularization : Vit B2 deficiency
- Opacities : Herpes Zoster
- Arcus senilis : white ring at periphery in atherosclerosis
- Kayser - Fleisher ring : green ring at periphery due to Cu deposition in Wilson's disease
- Calcification : hypercalcemia

6-Sclera :

a-Blue : thin sclera showing choroidal pigment beneath (normal variant) - causes are :
Congenital glaucoma "Buphthalmos" - Osteogenesis imperfecta

b-Yellow : jaundice "in day light"

- Definition : yellow discoloration of skin & mm due to $\uparrow$ bilirubin $> 3 \text{ mg } \%$ = manifest jaundice
- Detected : in sclera (in day light - patient must look up) & palate

DD of jaundice

- 1-Normal yellow sclera : in Negroes
- 2-Carotenemia : DM, myxedema, liver C. failure, Vit A. deficiency
- 3-Xanthomatosis
- 4-CRF : retention of yellow pigments (urochromogen) superimposed on pallor of anemia (dirty yellow)
- 5-Drugs : atebrine, miracil D, picric acid toxicity

Types of jaundice :

	<i>Hemolytic Jaundice</i>	<i>Obstructive Jaundice</i>	<i>Hepatocellular</i>
1-Causes	Excess hemolysis of RBCs → $\uparrow$ hemobilirubin	Obstruction of bile ducts → $\uparrow$ cholebilirubin	-Hepatitis, cirrhosis → $\uparrow$ both hemo & chole
2-Characters	-Lemon yellow jaundice -Dark stool -Normal urine colour -Others : pallor, leg ulcers, $\uparrow$ liver & spleen	-Olive green jaundice -Pale stool -Dark urine -Others : biliary pain, pruritis & bradycardia	-Orange yellow jaundice -Pale stool -Dark urine -Others : CLP of liver cell failure

7-Pupils & eye movement : "see neuro"

8-Lacrymal gland : swelling above outer canthus in $\Rightarrow$ Sarcoidosis -Rheumatoid - Sjogren's S.

9-Lens :

-Subluxation : Marfan's syndrome

-Cataract :

-endocrinal : DM -Cushing - myxedema

-metabolic : Wilson's disease - galactosemia - hypocalcemia

10-Fundus examination : papilledema (in brain tumor) -retinopathy (DM, hypertension)

V-NOSE & CHEEKS

1-Large nose : normal - pathological in acromegaly & myxedema

2-Saddle nose : depressed bridge

-Congenital : cretinism (poor cartilage formation) - congenital syphilis (gummatous necrosis)

-Traumatic : repeated fracture in boxing

-Leprosy

3-Working ala nasi : severe dyspnea (pneumonia, HF)

4-Nasal discharge :

-Watery "spinal fluid" in fracture base of skull

-Epistaxis : idiopathic, hypertensive, purpura

5-Sulfur granules : yellow raised follicles around nose (dried sebum) in Vit B₂ deficiency

6-Nasolabial fold : flattening in facial N. palsy

7-Butterfly area : "cheek - zygomatic bone" = *Local pigmentation* :

a-Red :

-malar flush in MS (reflex VD or compression of sympathetic chain)

-occurs also in SLE, myxedema, cushing, pregnant, alcoholics, even in normal people

b-Brown : pellagra - cloasma gravidarum in pregnancy

c-Petichae : in SBE - *dd from*

-spider naevi in liver C. failure : fade on pressure

-insect bite "flea" : itchy, generalized

VI- EARS & PAROTIDS

1-Ears : Tophi (small hard nodules in gout) - Ear discharge

2-Parotids : swelling anterior to ear lobes (raising it) & above angle of jaw

Causes of parotid enlargement

- 1-Epidemic parotitis (mumps) : tender + acute enlargement
- 2-Endemic parotitis (liver C. failure) : not tender
- 3-Granulomas as TB
- 4-Leukemia
- 5-Sjogren's syndrome
- 6-Mickulicz S. : enlarged salivary & lacrimal glands in leukemia

VII-MOUTH & THROAT

1-CYANOSIS

-Definition : bluish discoloration of skin & mm due to ↑ level of reduced HB in capillaries
> 5 gm % or due to abnormal HB in capillaries

- Normal reduced HB : 1-2 gm %
- Cyanosis never occur in severe anemia : incompatible with life
- Cyanosis appear easily in : polycythemia

☞Types of cyanosis :

1-Central cyanosis

2-Peripheral cyanosis

3-Chemical cyanosis : "false cyanosis"

- Abnormal HB simulate reduced HB - clinically simulate central cyanosis
- Causes : methemoglobinemia (nitrite ttt), sulphemoglobinemia (sulfonamide ttt)

4-Differential cyanosis :

- Cyanosis in LL only (absent in UL)
- Causes :
 - PDA with pulmonary hypertension (Eisenmenger PDA)
 - PDA with preductal (infantile) aortic coarctation

	Central Cyanosis = Hypoxic Hypoxia	Peripheral Cyanosis = Stagnant Hypoxia
1-Definition	Blood pumped in aorta contains more than 5 gm % reduced HB	Stagnation of blood in peripheral circulation leads to extraction of more O ₂
2-Causes	a-Congenital H.D. with Rt to Lt shunts : Eisenmenger's, F3, F4 b-Chest : COPD, massive fibrosis c-Asphyxia, high altitude d-Pulmonary A-V shunts : liver failure e-Polycythemia ?	a-Low CO : shock b-Congestive heart failure c-Cold exposure d-Arterial & venous diseases : Raynaud's & thrombosis e-Polycythemia ?
3-Site	-Tongue (under surface $\pm$ upper S.) (tongue mobile, no VC & nor stagnation) -Generalized : lips, nose, hand	Generalized only (not tongue)
4-Hand 5-Warming 6-Clubbing 7-O₂ Saturation 8-O₂ ttt	warm : hypoxia $\Rightarrow$ VD $\Rightarrow$ warmth No effect Present (blue clubbing) low < 80% -If lung disease : improve cyanosis -If congenital HD : no effect	cold (peripheral VC) cyanosis improve Absent Normal (95 - 98%) No effect

2-OTHERS

1-Lips :

- Pallor
- Angular cheilosis $\Rightarrow$ dryness + cracking : in B₂ deficiency, Fe deficiency
- Tremors : parkinsonism & thyrotoxicosis



2-Angular stomatitis : painful inflamed cracks at corner of mouth - in B₂ & Fe deficiency

3-Teeth :

- Caries
- Discoloration (in tobacco & bad oral hygiene)
- Hutchinson teeth in congenital S

4-Gums : bleeding gums occur in scurvy, leukemia, bleeding tendency & gingivitis

5-Buccal mucosa :

- Aphous ulcer (dyspeptic)
- Thrush : moniliasis
- Koplick's spot : in measles
- Pigmentation :
 - congenital in negroes
 - pathological : Addison's - hemochromatosis - Peutz-Jegher S. (familial polyposis)

6-Tongue :

a-Size : macroglossia in amyloidosis, acromegaly, myxedema -small, atrophic in LMNL

b-Surface :

-dry in mouth breather, dehydration as uremia -coated in fever as typhoid

-ulcers : aphthous in dyspepsia - specific ulcers in TB, \$, carcinoma

c-Colour : pale in anemia -slate colored : Addison's disease ($\uparrow$ ACTH)

d-Papillae:

-atrophy "red glazed" in $\downarrow$ Fe, $\downarrow$ B12, $\downarrow$ Niacin (pellagra), DM, myxedema

-enlarged "strawberry" : scarlet fever

7-Palate :

a-Hard palate (ant. 2/3) : cleft palate - high arched palate in Marfan's syndrome

b-Soft palate (post. 1/3) : movement of uvula & position

8-Tonsills : tonsillitis, tumor

9-Salivary gland :

-Opening of parotid duct can be seen opposite 2nd upper molar teeth

-Free flow of saliva can be seen if lemon juice is given to patient

10-Mouth odour : halitosis "*bad odour of mouth*" see abdomen - alcohol odour

VIII-NECK

1-Skin : carbuncle in DM

2-Nodding : AR (De Musset sign), Parkinsonism, cerebellar ataxia, myoclonic epilepsy, tics

3-Rigidity : meningitis

4-LN : if enlarged continue lymphadenopathy sheet

5-Thyroid gland : if goitre (swallow, extrusion of tongue)

-inspect : enlarged, vascular

-palpate : for size, nodules, systolic thrill (in thyrotoxicosis)

-percuss : upper border of sternum (for retrosternal extension)

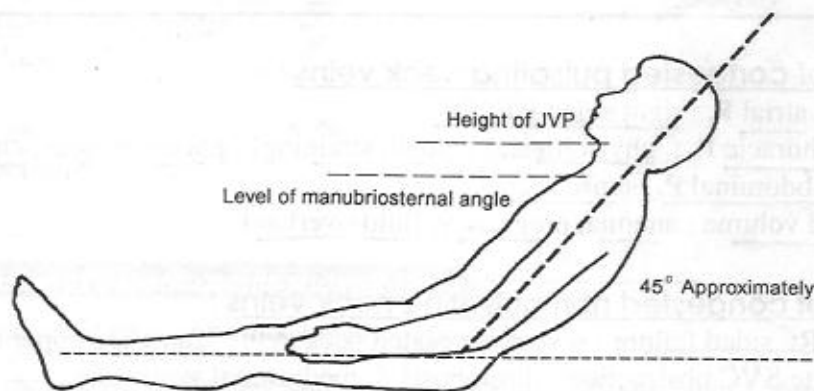
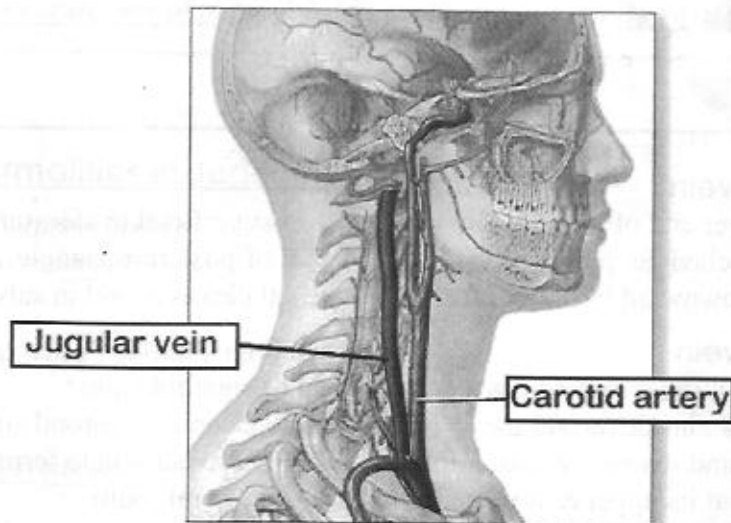
-auscultate : for systolic bruit ($\uparrow$ vascularity in thyrotoxicosis)

7-Neck pulsation :

Arterial pulsation "carotid arteries"	Venous pulsation "jugular veins"
1-Anterior triangle "medial to sternomastoid" & more apparent in upper part of neck	1-Posterior triangle "lateral to sternomastoid" & more apparent in lower part of neck
2-Synchronous with heart beats	2-Before & after heart beats
3-Better felt than seen	3-Better seen than felt
4-1 wave (1 jerk)	4-Wavy (a, v waves)
5-4 negatives -do not fade on gentle pressure -not affected by posture -not affected by respiration -not affected by hepatjugular reflux	5-4 positives -fade on gentle pressure -affected by posture -↓ with insp. (except in peric. effusion) -↑ by hepatjugular reflux

⌘ **Hepatojugular reflux :**

mild pressure on liver or abdomen lead to elevation of upper level of vein with no affection of artery
(1 minute pressure test) - It is +ve in TR



Suggested position for examination of JVP

NECK VEINS

I-Jugular Venous Pressure = column elevation

- Measured by noting vertical distance in Cm between the top of blood column in IJV (better than external jugular) and sternal angle (normally 2-3 cm)
- Observation of venous wave & JVP measurement are best made in the Rt IJV as it has the most direct channel to the Rt. atrium (without valves)
- External JV waves (superficial V.) are delayed, flattened & may be kinked

-Central venous pressure "CVP" : pressure in center of Rt atrium as measured by a catheter

$$\text{CVP} = \text{JVP} + 5 \text{ cm}$$

-Position of patient :

- Relaxed sternomastoid + patient lies at 45°
- Venous pressure is increases if neck veins are congested above level of manubrio-sternal angle of Lewis (Rt. atrial level) - normally visible just above clavicle (2-3 cm)
- When venous pressure is ↑ (congested neck vein) an elevation up to 90° may be required
- We measure JVP during *inspiration*
- To differentiate congested EJV from normal apparent visible vein, press at lower border of vein. If caliber of vein increases, this means **normal** vein

JUGULAR VEINS

-External J. vein :

- Begins at lower end of parotid gland & descends superficial to sternomastoid
- 1 inch above clavicle, pierces deep fascia of roof of posterior triangle
- It then runs downward in front of trunks of brachial plexus to end in subclavian vein

-Internal J. vein :

- Start : in jugular foramen as a continuation of sigmoid sinus
- Descends : inside carotid sheath lateral to ICA & common carotid arteries (CCA)
- Ends behind sternoclavicular joint by joining subclavian vein to form innominate vein
- Dilates : at its upper & lower ends to form sup. & inf. bulb
- S. anatomy : line drawn from sternoclavicular joint to a point mid way between angle of mandible and mastoid process

-Causes of congested pulsating neck veins :

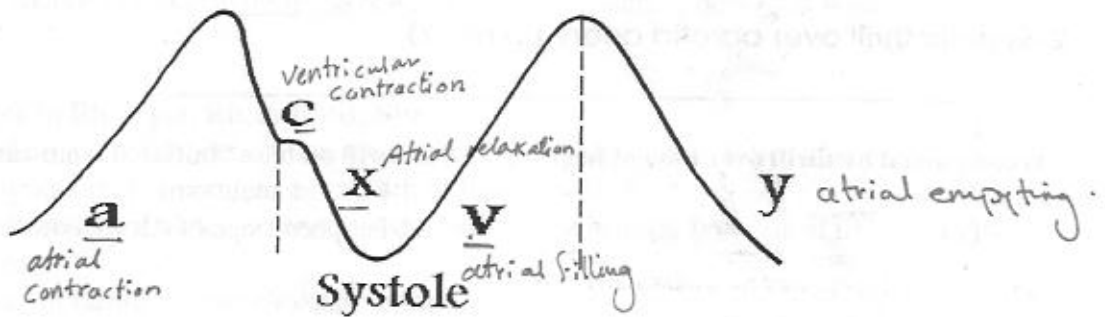
- 1-↑Right atrial P. : right sided HF, TR
- 2-↑Intrathoracic P. : physiological (cough, straining) , pneumothorax, emphysema
- 3-↑Intraabdominal P. : tense ascites
- 4-↑Blood volume : anemia, pregnancy, fluid overload

-Causes of congested non pulsating neck veins :

- 1-Severe Rt. sided failure : severe congested neck veins "can't see upper border"
- 2-Complete SVC obstruction : thrombosis & mediastinal syndrome
- 3-Pericardial effusion & constrictive pericarditis

II- Jugular Venous Pulse = Waves

The waves of JVP reflect the changing pressure in Rt atrium $\therefore$ neck veins act as manometer arising from Rt. atrium & reflecting pressure changes inside it. These waves are :



a wave : Rt atrial contraction

c wave : onset of RV contraction leading to cusp bulge in Rt. atrial cavity (not visible normally)

x descent : atrial relaxation with $\downarrow$ pressure in Rt atrium

v wave : atrial filling by venous return (occur during ventricular contraction)

y descent : atrial emptying (opening of tricuspid valve)

$\Rightarrow$ X descent occur at time of pulse - so venous pulsation show normal **systolic collapse**

Common abnormalities in Jugular venous pulse :

a-Causes of giant v (prominent) wave = systolic expansion :

TR & AF (due to associated TR)

b-Causes of giant a wave : forcible atrial contraction in

1-TS

2-PS

3-Pulmonary hypertension

c-Causes of cannon a wave : synchronous atrial & ventricular contraction

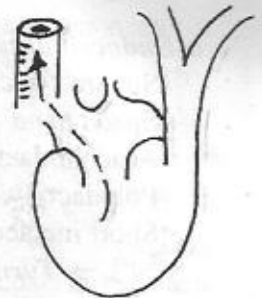
1-Nodal rhythm & paroxysmal nodal tachycardia

2-Paroxysmal ventricular tachycardia

3-Complete heart block

d-Cause of absent a wave :

AF (no atrial contraction)



Neck veins in constrictive pericarditis show 2 signs :

1-Kussmaul' sign : congested neck veins showing inspiratory filling

2-Friedreich's sign : congested NV showing sudden severe diastolic collapse (rapid & deep Y descent)

CAROTID ARTERIES

1-Causes of visible arterial pulsation "Corrigan's sign" : same causes of big pulse pressure
esp. AR *visible arterial pulsation may be seen in thin people*

2-Systolic thrill over carotid artery (in neck)

↓
Accompanied by thrill over base of heart

- 1-AS
- 2-PDA

↓
No thrill on base "initiated from carotids"

- 1-Carotid aneurysm
- 2-Peripheral sign of AR (& other causes of big PP)

IX-UPPER LIMBS

1-Grip : flabby in myopathy - inability to relax in myotonia

2-Shape :

a-Neurological :

- Wasting of small ms : in LMNL esp. myopathy
- Wrist drop : radial N. palsy, polyneuropathy
- Claw hand : ulnar palsy, motor neuron disease

b-Endocrinal :

- Square : in cretinism
- Spade hand : acromegaly (large, broad)
- Arachnodactyly : "spider fingers" in Marfan syndrome
- Polydactyly & syndactyly : in Frohlich's syndrome
- Short metacarpals : when making a fist
 $4^{th} \Rightarrow \text{Turner's syndrome}$ $4^{th} \text{ \& } 5^{th} \Rightarrow \text{pseudohyperparathyroidism}$

c-Duputren's contracture "pulmar fibromatosis" : fibrosis of palmar aponeurosis with flexed inner 2 or 3 fingers) :

- idiopathic : familial
- 2nry : DM, alcoholism, epilepsy

d-Rheumatoid deformities : ulnar deviation, Swan neck, Z shape thumb

3-Skin :

- a-Pallor : in palmar creases (in anemia)
- b-Cyanosis
- c-Palmar erythema : in liver failure
- d-Dermatitis : pellagra ($\downarrow$ niacine) & $\downarrow$ Vit. A.

e-Trophic changes : ischemia, neuropathy e.g. DM
f-Shiny, stretched + limited mobility : in scleroderma

g-Temperature & sweating :

- 1-Cold : constitutional, neurosis, Raynaud's, peripheral cyanosis, low CO, anemia
- 2-Warm : thyrotoxic, central cyanosis, corpulmonale, liver failure, fevers
- 3-Sweating : confined to palm in neurosis & acromegaly - in palm & dorsum of hand in thyrotoxic

h-Nodules :

- 1-SC nodules in Rh. fever, Rh. arthritis, SLE
- 2-Osler's nodules : small tender intracutaneous, dark over pulps thenar & hypothenar in SBE
- 3-Janeway spots : purple painless over palm of hands in SBE
- 4-Heberden & Bouchard nodes : in 1ry osteoarthritis - occur in distal & proximal IP (respectively)
- 5-Tophi of gout
- 6-Xanthoma : in familial hypercholesterolemia

4-Movements :

-**Involuntary** : semipurposeful in chorea

- a-Fine : parkinsonism, ataxia, thyrotoxicosis, alcoholic, familial
- b-Coarse or flapping tremors "astrexis" :
in organ failure as liver F, renal F., respiratory F.



Astrexis

5-**Nails** : normally shiny, convex in side view with obtuse nail bed angle (160°) - *Abnormalities are :*

* **Shapes :**

- Trophic changes "dystrophy"** : loss of luster, brittle, discolored, transverse ridges occur in :
 - ischemia
 - neuropathy (esp. leprosy)
 - vitamin deficiencies
 - hypocalcemia

-**Koilonychia** : nail spooning in Fe deficiency

-**Onycholysis (Plummer's nail)** : premature lifting of distal nail in thyrotoxicosis & psoriasis

-**Beau's lines** : transverse depression seen after severe illness

-**Clubbing**

* **Colours :**

-**Leuchonychia** : abnormal white nail (imperfect keratinization) in :

- idiopathic in some normal individual
- $\downarrow$ albumin : liver failure, nephrotic S., debilitating diseases

-**Pigmentation** : yellowish brown in CRF

-**Splinter hemorrhage** : linear hemorrhage under nail in SBE

-**Capillary pulsation** : in AR

Clubbing of Fingers

-Definition : proliferation of CT nail bed (normally nail angle is 160°) in response to :

- 1-Chronic toxemia : pale clubbing = acyanotic
- 2-Chronic hypoxia : blue clubbing = cyanotic
- 3-Other mechanisms : irritation, immune

-Degrees :

- 1st : obliterated nail bed (window or "Schamroth's" sign) - Fluctuation is present
- 2nd : parrot peak
- 3rd : drum stick
- 4th : 3rd grade + pulmonary osteoarthropathy $\Rightarrow$ tender thickening of ends of long bones "radius & ulna"

- ✎ -4th grade may occur alone irrespective of grading as in bronchial carcinoma
 -Grade 0 = softening of nail bed

-Causes of clubbing :

a-Cardiac causes :

- 1-Congenital cyanotic heart disease (F4, Eisenmenger) "blue"
- 2-SBE "pale"

b-Chest :

- 1-Pulmonary fibrosis
- 2-Suppurative lung syndromes : lung abscess, bronchiectasis
- 3-COPD : clubbing usually mild - marked in associated bronchiectasis
- 4-Fibroid type of pulmonary TB
- 5-Bronchogenic carcinoma & pleural mesothelioma

c-GIT :

- 1-liver C. : esp. 1ry biliary C
- 2-Bilharzial polyposis - familial polyposis
- 3-Malabsorption syndrome (steatorrhea)
- 4-Ulcerative colitis & Crohn's disease

d-Occupational : shoe makers, carpenters (usually in thumb & index)

e-Local causes : unilateral clubbing = causes of unequal pulse as Pancoast tumor, cervical rib

f-Miscellaneous :

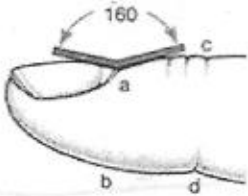
- 1-Familial : 5% of cases
- 2-Thyroid acropachy (in thrototoxicosis)

- ✎ -Causes of reversible clubbing = pleural mesothelioma, endocarditis, empyema
 -Causes of clubbing in LL only = causes of differential cyanosis (PDA- coarctation of aorta)

Eisenmenger

CLUBBING

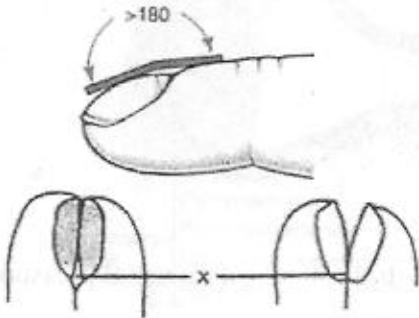
Normal Finger
nail angle = 160°



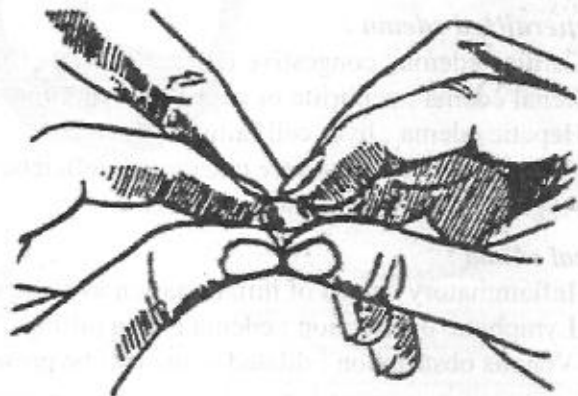
Clubbed fingers



Grade 1:
lost window



Grade 2:
parrot beak



Grade 3:
drum stick



Fluctuation test

X-LOWER LIMBS

1-Shape :

- High arched foot (pes cavus) : congenital, peroneal muscle atrophy
- Dropped foot : peripheral neuropathy

2-Nails - Skin : as in UL - remember varicose ulcers

3-Edema :

-**Method** : 1 minute pressure test

-**Sites** : behind medial malleolus - chin of tibia - dorsum of foot

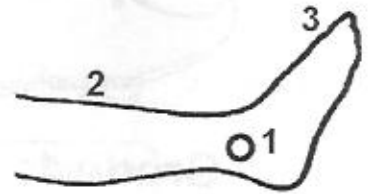
-**Other sites** : sacrum (over the back in recumbent patients)

-**Comment** :

- * Unilateral or bilateral
- * Pitting or not
- * Extent (localized or generalized), site of onset
- * Tender or not

-**Types of edema** :

- * Soft pitting : renal, cardiac
- * Hard "non pitting" : in chronic lymphatic obstruction - It does not pit on usual pressure + overlying skin is rough, thick "peau d'orange"



Causes of edema

a-Generalized edema :

- 1-Cardiac edema : congestive HF, pericardial effusion
- 2-Renal edema : nephritic or nephrotic syndromes
- 3-Hepatic edema : liver cell failure
- 4-Nutritional edema : severe nutritional deficiency or malabsorption syndrome
- 5-Angioneurotic edema : allergic edema

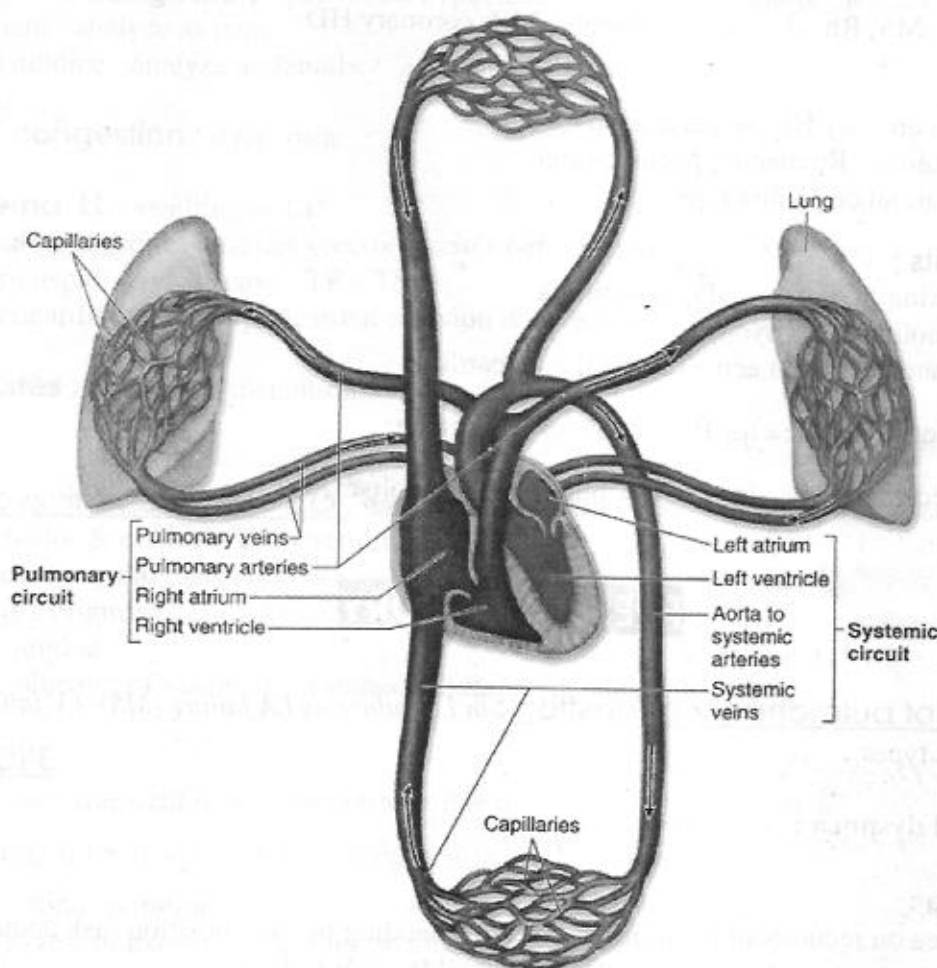
b-Local edema :

- 1-Inflammatory : signs of inflammation as redness, hotness & tenderness
- 2-Lymphatic obstruction : edema is non pitting
- 3-Venous obstruction : dilated veins will be present

4-Vessels :

- a-Dorsalis pedis artery pulsation : lateral to tendon of extensor hallucis longus
- b-Tibialis posterior : behind medial malleolus

CARDIOLOGY



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HISTORY

PERSONAL HISTORY

1-Age : young : congenital HD -middle to old : coronary HD

2-Sex : females : MS, Rh. chorea -males : MR, coronary HD

3-Occupation :

- stressful job : coronary HD, hypertension
- vibrating machines : Raynaud's phenomenon
- farmers : Bilharzial cor pulmonale

4-Special habits :

- cigarette smoking : coronary HD, arrhythmia
- alcohol : alcoholic cardiomyopathy
- IV addicts : fungal & staph acute bacterial endocarditis

5-Residence : endemic area for Bilharzial cor pulmonale

6-Marriage : recent delivery for DVT & pulmonary embolism

PRESENT HISTORY

1-Symptoms of pulmonary congestion : in LS failure as LA failure (MS), LV failure

a-Dyspnea : types :

-Exertional dyspnea : on effort

-Orthopnea :

- ⇒ Dyspnea on recumbent position, relieved by standing in erect position (ask about N^o of pillow)
- ⇒ Pathognomonic of LS failure as LA failure (MS), LV failure
- ⇒ Occur also in tense ascites & severe emphysema

-Paroxysmal nocturnal dyspnea , cardiac asthma , acute pulmonary edema :

- ⇒ Pathognomonic of LS failure
- ⇒ Pt wakes up after 2 h. of sleep with severe dyspnea , cyanosis , cough , expectoration (PND) bronchospasm & wheezes (CA) , pink frothy sputum (APE)

⌘ **Grades of Cardiac dyspnea :** according to New York Heart Association (NYHA)

Grade 1 : no breathlessness

Grade 2 : breathlessness on extraordinary exertion e.g. 3rd floor or 300 m.

Grade 3 : breathlessness on mild exertion e.g.: 2nd floor or 200 m.

Grade 4 : breathlessness at rest including orthopnea , PND, cardiac asthma & APO

⌘ **Platypnea :** opposite of orthopnea - occurs in severe fevers

b-Exertional cough

c-Hemoptysis :

- Frank hemoptysis : MS , pulmonary infarction
- Frothy blood tinged sputum : in acute P. edema

d-Recurrent chest infection : winter bronchitis in MS**2-S. of systemic congestion :** occur in RS failure (TS , RVF) & pericardial disease**a-Hepatic congestion :** pain in Rt hypochondrium, epigastrium & jaundice.

- If pain : analyze as pain
- If Jaundice : analyze as Jaundice

b-GIT congestion : dyspepsia**c-Edema LL :** swelling of LL

Relation to ascites : ascites precox (ascites before edema) occur in :

- Tricuspid valve disease : TR - TS
- Pericardial disease : pericardial effusion & constrictive pericarditis

d-Ascites : abdominal distention**3-S. of Low "inadequate" CO :** non specific - occur in HF, valve stenosis , shock, arrhythmia

- Skin : pallor & coldness of extremities
- Muscles : easy fatiguability, claudication of LL
- Kidneys : oliguria
- Heart : angina
- Brain : blurring of vision, drowsiness, giddiness, dizziness & syncope

SYNCOPE :

-Definition : transient loss consciousness due to low CO or brain anoxia.

(dizziness is the degree before syncope - drowsiness is a sign)

-Onset, course, duration

-Type : at rest or exertional (during or after exercise)

Causes of syncope**1-Cardiac syncope :** due to low CO

- Hemorrhage -AS
- Massive P. embolism -Massive M. infarction

2-Neurocardiogenic syncope :

- Vasovagal attack : exposure to fear, emotions
- Carotid sinus syndrome : stimulation of hypersensitive carotid sinus

3-Orthostatic syncope : "postural syncope"

autonomic neuropathy (DM), huge varicose veins, essential postural hypotension

4-Neurological syncope : transient ischemic attacks, hypertensive encephalopathy

high altitude, severe anemia, CO poisoning , Hypoglycemia, Hypoxic syncope (F4)

4-Symptoms of congenital heart disease :**a-Cyanotic :**

- age of onset : since birth : F_4 -between 3- 10 years : F_3 -In teenager = Eisenminger's
- types : central - peripheral - differential (in LL only) $\Rightarrow$ PDA
- cyanotic spells : relieved by *squatting* in F_4
- associated congenital anomaly : syndactyly or polydactyly

b-Acyanotic : winter bronchitis & exertional cyanosis: in Lt - Rt shunts

5-Palpitation : awareness of heart beats due to change in rate, rhythm, duration - Ask about

- Onset, duration
- Precipitating & relieving factors (at rest or exertional)
- Rhythm : regular or irregular
- Rate : rapid or slow

6-Chest pain :

- Site & radiation
- Character & intensity
- Duration & frequency
- Precipitating & relieving factors
- Relation to : exertion, respiration, meals & posture

Causes of chest pain :**a-Cardiovascular :**

- | | |
|--|---------------------------------|
| 1-Coronary H.D. : angina - M. infarction | 2-Pericarditis - Peric effusion |
| 3-Pulmonary infarction | 4-Aortic aneurysm |
| 5-Dissecting aneurysm of aorta | 6-Pain of cardiac neurosis |

b-Respiratory :

- 1-Acute pleurisy, pl. effusion, pneumothorax, acute massive lung collapse
- 2-Lung diseases extending to pleura

c-Mediastinal :

- 1-Mediastinal tumors
- 2-Esophageal : spasm, reflux esophagitis, cancer

d-Chest wall :

- | | |
|--|--|
| 1-Skin : infection, tumor | 2-Breast : mastitis, abscess, tumor |
| 3-Ribs : fracture, osteomyelitis | 4-Intercostal ms : ms strain, myositis |
| 5-Intercostal N.: root pain, Herpes Zoster | |

e-Abdominal : "referred pain"

- | | |
|--|------------------------|
| 1-Gastritis, peptic ulcer, hiatus hernia | 2-Gall bladder disease |
| 3-Amebic liver abscess, subphrenic abscess | 4-Peritonitis |

**7-Pressure Symptoms :** in LA enlargement - pericardial effusion - aortic aneurysm

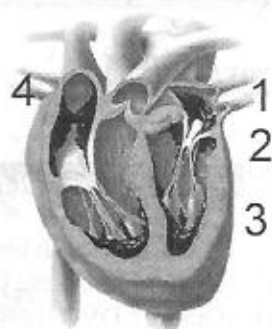
- Trachea : brassy cough (of metallic tone)
- Bronchi : dyspnea (esp. in lying on back)
- Esophagus : dysphagia
- Lt. recurrent laryngeal nerve : hoarseness of voice

8-Symptoms suggestive of $\uparrow$ BP :

headache - blurring of vision - tinnitus, vertigo - epistaxis

9-Symptoms of systemic embolization :**-Origin :**

- 1-Atrium : Lt atrium in MS esp. when AF develops
- 2-Valve : mitral & aortic valves in SBE
- 3-Ventricle : Lt V mural thrombus in M. infarction
- 4-Vessel : aortic atherosclerotic plaque in atherosclerosis

**-Effects :**

- 1-Middle cerebral artery : embolic hemiplegia
- 2-Central retinal artery : sudden blindness
- 3-Coronary artery : chest pain (myocardial infarction)
- 4-Superior mesenteric artery : abdominal pain (intestinal obstruction)
- 5-Splenic artery : pain in Lt hypochondrium
- 6-Renal artery : painless hematuria
- 7-Peripheral artery : pulseless, pallor, pain, paresthesia & paralysis

10-Symptoms of peripheral vascular diseases :

- Intermittent claudication pain : pain in calf muscles with walking & relieved by rest
- Raynaud's phenomenon
- Swelling of calves in DVT
- Trophic changes : loss of hair, ulcers, pallor, coldness, lost sensation

11-Fever : onset - course (type) - duration - associated symptoms -history of drug intake**12-Symptoms of other systems :** chest - git - neuro**PAST HISTORY****a-Diseases :**

- 1-Rh. fever : arthritis, fever, ttt with salicylates
- 2-I. endocarditis : fever, bleeding, pallor, pain in left hypochondrium.
- 3-Bilharziasis : for B. cor pulmonale
- 4-TB : toxemia, sanatorium, anti TB ttt (for pericarditis & pericardial effusion)
- 5-Syphilis : repeated abortion (for S. aortic regurge)
- 6-DM : polyuria, insulin or oral ttt

b-Drugs : for 2nry hypertension : steroids - sympathomimetics - carbenoxolone - c.Pills -T4**FAMILY HISTORY**

- Similar condition in the family : Rh. fever - congenital heart disease
- Common diseases : hypertension, DM, coronary heart disease, hepatitis
- Positive consanguinity

GENERAL EXAMINATION

A-VITAL SIGNS : pulse , BP, resp. rate , temp

Causes of fever in a cardiac patient :

- | | |
|---|---|
| -Endocardial : Rh.fever or activity - SBE | -Myocardial : acute M. infarction - myocarditis |
| -Pericardial : acute pericarditis | -Pulmonary : pulmonary infarction - pulmonary infection |
| -Others : DVT - associated fevers | |

B-GENERAL EXAMINATION :

1-General observation :

- a-Body built : Marfan's syndrome in congenital AR - Stunted growth in congenital HD
- b-Decubitus : orthopnea in severe HF

2-Face "appearance": pallor in Rh. fever, SBE

3-Eye :

- puffy eye lids in edema (H.failure)
- jaundice

Causes of jaundice in a cardiac patient :

- 1-Hemolytic J. : in pulmonary infarction, artificial valves
- 2-Hepato cellular J. : in marked hepatic congestion (cardiac cirrhosis) due to :
severe Rt. sided HF - pericardial effusion -TS & TR
- 3-Obstructive J. in : bile & inspissation of bile in canalicular lumen
- 4-Associated viral hepatitis : the commonest

4-Skin "complexion" ⇒ cyanosis

- central : in cyanotic congenital HD as F₄ - or advanced HF
- peripheral in low CO
- differential in PDA

5-Nose & cheek : malar flush of MS

6-Neck :

- neck veins : congeted pulsating in congestive HF - congested non pulsating in pericardial effusion
- carotid arteries : thrill in AR & AS

7-UL :

- Nails :
 - clubbing ⇒ pale in SBE , blue in central cyanosis as F₄
 - splinter hemorrhage in SBE
 - capillary pulsation in AR
- Nodules :
 - SC in Rh. fever
 - Osler's nodes in SBE
 - Xanthomas in extensor tendons of fingers (features of hyperlipidemia)

8-LL : edema in HF, pericardial disease

General "peripheral" signs of AR (big PP)**a-Head & neck :**

- 1-Corrigan pulse : visible vigorous pulsation in carotid arteries in neck
- 2-De Musset sign : head nodding due to severe pulsation
- 3-Systolic thrill : over carotids due to rapid blood flow

b-Upper Limb :

- 1-Capillary pulsation "Quinke's pulse" demonstrated as follows :
holding patient's hand (digital throbbing) -pressing by finger on patient's nail
- 2-BP : high systolic, very low diastolic and very big pulse pressure
- 3-Water - Hammer pulse "Collapsing pulse"

c-Lower Limb :

- 1-Hill's sign : difference in systolic BP between LL may reach 60 mm Hg
- 2-Pistol shot : auscultation of a loud sound synchronous with each pulse on femoral artery
- 3-Duroziez double murmur : on pressing femoral a. systolic as well as diastolic murmur are heard

C-ABDOMINAL EXAMINATION :**1-Liver :**

- enlarged & tender in : RVF, pericardial disease
- enlarged, tender with expansile pulsation : TR, TS
- enlarged firm , with sharp border : cardiac cirrhosis

2-Spleen : enlarged in RVF, pericardial disease**3-Ascites :** after edema in RVF, or ascites precox in TR, TS, pericardial disease**D-BACK EXAMINATION :****1-Murmurs - Bruit :**

- of MR : left scapular region
- of coarctation of aorta : interscapular region
- bruit of renal artery stenosis in renal angle

2-Crepitations :

- bilateral basal crepitation : LVF
- bubbling coarse crepitations : pulmonary edema

3-Ewart's sign : collapse of left lower lobe in pericardial effusion**4-Vertebrae - Scapula :**

- spina bifida : associated congenital anomaly in congenital HD
- low back pain, stiffness & limited spine mobility in ankylosing spondylitis associated with AR
- anastomosis around scapula in coarctation of aorta

5-Skin : Cafe' au lait patches in neurofibromatosis associated with pheochromocytoma & IHSS

INTRODUCTION TO LOCAL EXAMINATION

Sounds, Murmurs & Their Relation To Cardiac Cycle :

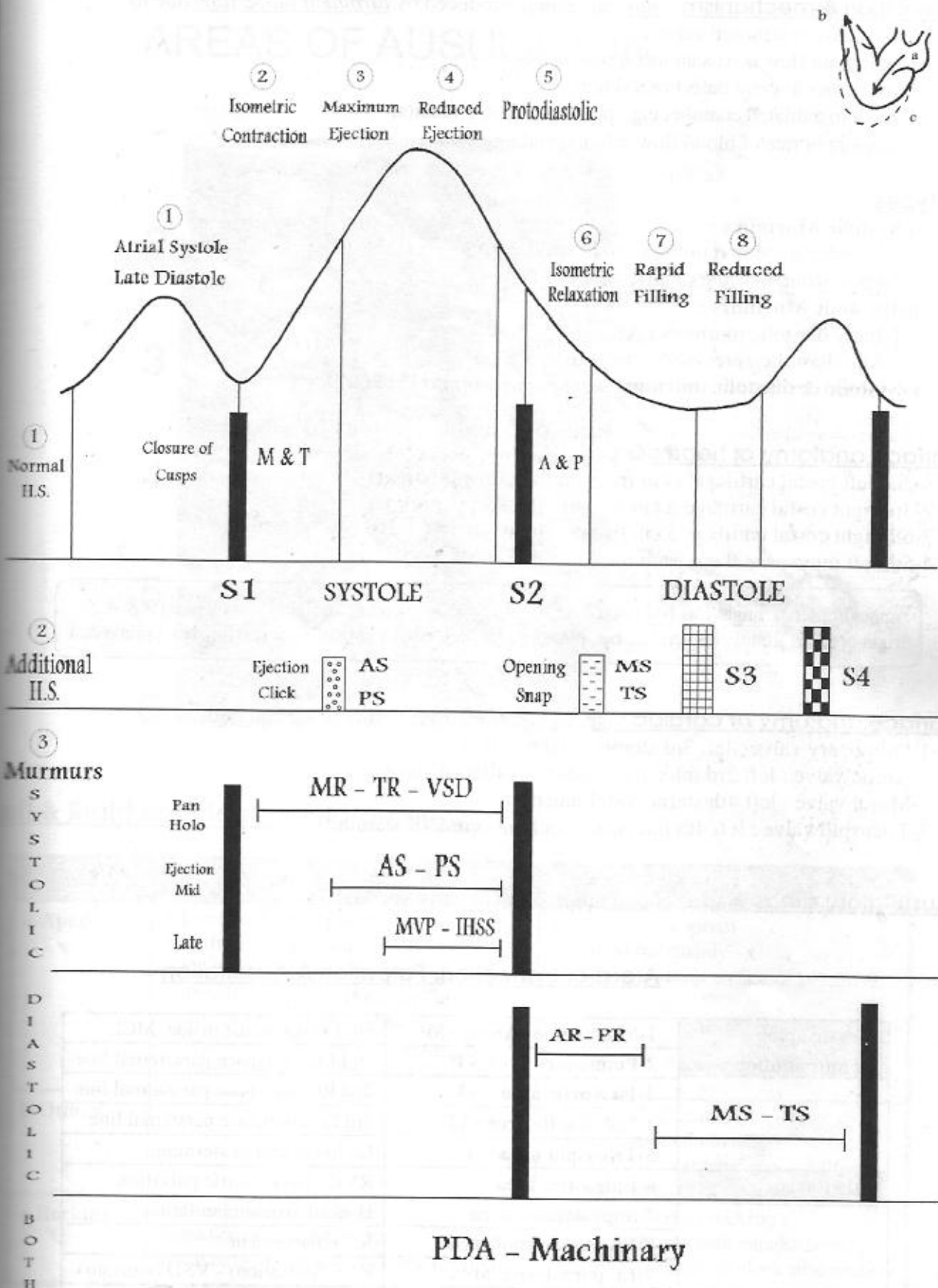
- 1-Isometric contraction phase :** cardiac cycle starts by contraction of ventricles resulting in closure of M & T valves producing **S1**. Ventricles contract while the 4 valves of heart are closed raising pressure in ventricles rapidly without change in volume (isometric)
When pressure in ventricles exceeds pressure in A & P artery, A & P valves open (*normally soundless*)
- 2-Maximum ejection phase :** blood rushes from ventricles in A & P artery, at first rapidly
- 3-Reduced ejection phase :** blood then rushes from ventricles in A & P artery slowly.
After evacuation of blood, the ventricles tend to relax, so pressure in A & P artery exceeds pressure in ventricle resulting in closure of A & P valves producing **S2**
- 4-Protodiastolic phase :** period between end of V. ejection and closure of A & P valve
- 5-Isometric relaxation phase :** ventricles continue to relax, while the 4 valves of heart are closed, so pressure inside ventricles falls rapidly without change in volume
When pressure in ventricles become lower than P. in atria, M & T valves open (*normally soundless*)
- 6-Maximum filling phase :** blood rushes rapidly from A to V, at first rapidly
- 7-Reduced filling phase :** blood then rushes from A to V slowly.
Both 6 & 7 phases form 2/3 of blood volume
- 8-Atrial systole or late diastole :** the last 1/3 of blood in atria is pushed by atrial contraction
Ventricular contraction occurs again & the cycle is repeated

Heart Sounds :

- 1-First heart sound **S1** : caused by closure of mitral & tricuspid valves
- 2-Second heart sound **S2** : caused by closure of aortic & pulmonary valves
↳ diseases of M or T valves affect S1, while diseases of A or P valves affect S2
- 3-Third heart sound **S3** may be heard over M or T area if a large volume of blood (volume load) passes rapidly through corresponding valve or due to marked vibration of flabby myocardium
- 4-Fourth heart sound **S4** may be heard over M. or T. area if Lt or Rt atrium (respectively) contract vigorously (*pressure load*)

Added Sounds :

- 1-Opening sounds :** opening of heart valves is soundless - in fibrosed cusps valvular opening may produce sounds
 - opening of fibrosed M or T valve = opening snap
 - opening of fibrosed of A & P valve = ejection click
- 2-Others :** pericardial rub - pericardial knock in constrictive pericarditis - tumor plop



Murmurs :

-Definition & mechanism : *musical sounds* produced by *turbulent blood flow* due to :

- 1-Flow across a stenosed valve
- 2-Regurgitant flow across an incompetent valve
- 3-Flow across a septal defect or a shunt
- 4-Flow into a dilated chamber e.g.: pulm. or aortic dilatation
- 5-↑ amount or rate of blood flow = functional murmurs

-Types :**a-Systolic Murmurs :**

- 1-Systolic ejection murmurs (mid systolic) : AS - PS
- 2-Pansystolic murmurs : MR - TR - VSD

b-Diastolic Murmurs :

- 1-Early diastolic murmurs : AR - PR
- 2-Mid diastolic , presystolic murmurs : MS - TS

c-Systolic & diastolic murmur "continuous murmur" : PDA**Surface anatomy of heart : 4 points**

- 1-2nd left costal cartilage 4 cm from midline (lower border)
- 2-3rd right costal cartilage 3 cm from midline (upper border)
- 3-6th right costal cartilage 3 cm from midline
- 4-5th left interspace 9 cm from midline (apex)

*upper border : straight line bet. point 1 & 2

*lower border : straight line bet. point 3 & 4

*right border : slightly curved line bet. point 2 & 3

*left border : slightly curved line bet. point 4 & 1

Surface anatomy of cardiac valves : adjacent to lt border of sternal body

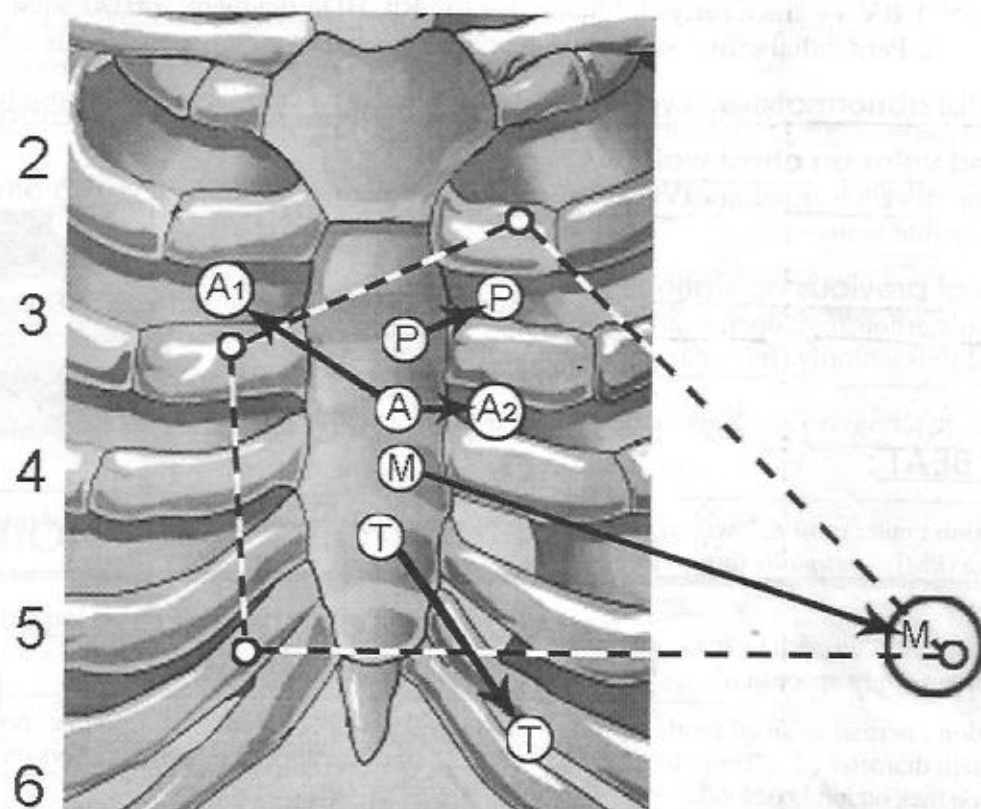
- 1-Pulmonary valve : left 3rd sternocostal junction
- 2-Aortic valve : left 3rd interspace (lateral border of sternum)
- 3-Mitral valve : left 4th sternocostal junction
- 4-Tricuspid valve : left 4th interspace (behind center of sternum)

Ausultatory areas = areas of *best* propagation of valve sounds

Areas of Inspection, Palpation & Ausultation

Classic areas Of auscultation	1-Mitral area (Apex) - M	5th Lt. space just inside MCL
	2-Pulmonary area - P	2nd Lt. interspace parasternal line
	3-1st Aortic area - A1	2nd Rt. interspace parasternal line
	4-2nd Aortic area - A2	3rd Lt. interspace parasternal line
	5-Tricuspid area - T	Lt. lower end of sternum
Other areas	6-Epigastlic area	RVE - liver - aortic pulsation
	7-Suprasternal area	Hyperdynamic circulation
	8-Rt. parasternal area	RA enlargement
	9-Lt. parasternal area	RVE (pulsation) - VSD (murmur)
	10-Axillary area	Propagation of MR murmur

AREAS OF AUSCULTATION



Left & Right ventricular enlargement :

	LV Enlargement	RV Enlargement
a-Apex	1-Localized (in 1 space) 2-Shifted out & down 3-Forcible (stronger than normal) -either : -forcible sustained (<i>heaving</i>) in tension load (AS, systemic hypertension) -forcible unsustained (<i>hyperdynamic</i>) in volume load (AR, MR)	1-Diffuse (> 1 space) 2-Shifted out mainly 3-Tapping (weak)
b-Others		4-Epigastric pulsation 5-left parasternal pulsation 6-↑ dullness over bare area + dullness over lower 1/3 of sternum
c-Rocking	Left or internal rocking : Retraction of Lt parasternal spaces with each apical bulge due to anticlockwise rotation	Right or external rocking : Retraction of apex with simultaneous Lt parasternal bulgedue to clock wise rotation

INSPECTION

I-CHEST WALL

1-Precordial bulge :

- Precordium : is the area of chest overlying heart , 2nd to 6th space parasternal to MCL
- Causes : 1-RV ++ since early childhood due to : Rh. HD - Congenital HD
- 2-Pericardial effusion (rarely)

2-Skeletal abnormalities : kyphoscoliosis or pectus excavatum may predispose to H.F.

3-Dilated veins on chest wall :

- Causes : SVC obstruction - IVC obstruction "see direction of filling of veins"
- DD : visible veins

4-Scars of previous operations :

- Median sternotomy : open heart surgery e.g.: valve replacement
- Lateral thoracotomy (inframammary) : mitral valvotomy



II-APEX BEAT :

-**Definition** : outer most & lower most, visible (& palpable) pulsation over chest = point of maximum impulse (PMI) - normally formed by LV

-Site :

- normally in adult : 5th Lt space just inside MCL in supine position
- children : 4th Lt space in MCL

-**Palpation** : normal $\Rightarrow$ small gentle tap which stays less than 2/3 of normal systole. It does not exceed 1-2 cm in diameter (2 x 2 cm - localized to 1 space) . Apex is palpated by tips of fingers on supine position then on left lateral side.

-Absent :

- Chest causes : obesity, behind a rib, emphysema, pneumothorax, pleural effusion
- Cardiac : peric. effusion, constrictive pericarditis, weak contraction (M. infarction), dextrocardia

-Upward displacement :

- Supradiaphragmatic : collapse or fibrosis in upper lobe of Lt lung.
- Diaphragmatic : paralysis of Lt copula of diaphragm.
- Infradiaphragmatic : tense ascites, tumors & pregnancy

-Downward displacement :

Thin individuals with long chest -Emphysema "COPD" -Visceroptosis

-Inward "to the Rt." displacement :

- Cardiac causes : congenital dextrocardia
- Lung causes : Rt. sided fibrosis & collapse -Lt. sided pl. effusion & pneumothorax

-Outward "to the Lt." displacement :

- Cardiac causes : RV ++
- Lung causes : Lt sided fibrosis & collapse -Rt. sided pl. effusion & pneumothorax.

-Outward & downward displacement : LV ++

III-PULSATION OF DIFFERENT AREAS :

- 1-**Epigastric pulsation** : look tangentially & ask patient to hold breath - causes are :
RV ++ - aortic - hepatic (differentiated by palpation)
- 2-**Left parasternal pulsation** : 3rd & 4th spaces - look tangentially & ask pt to hold breath :
-RVE : hypertrophy or dilatation
-Huge Lt. atrium (causing forward displacement of RV)
- 3-**Right parasternal pulsation** : Rt. atrium enlargement -huge left atrium -aneurysm of aorta
- 4-**1st aortic area** : 2nd Rt. space $\Rightarrow$ aortic dilatation (aneurysm), systemic hypertension
- 5-**Pulmonary area** : 2nd Lt space $\Rightarrow$ PA dilatation "pulmonary hypertension"
(e.g. grade 3 MS) - It is associated with diastolic shock (palpable accentuated S2)
- 6-**Suprasternal and/or carotid pulsation**
causes : all causes of prominent arterial pulsation "especially AR = Corrigan's sign"

PALPATION

Aim : look for pulsation (as confirmation), thrill, palpable sound

Thrill is :

- The palpable counterpart to murmur having same timing
- Palpable vibration that feels like placing one's hand on a purring cat
- Like murmurs, thrills can be timed against carotid pulse

1-APEX :

a-Pulsation

b-Thrill : systolic - diastolic (timing with carotid)

c-Palpable sounds :

- palpable S1 = slapping apex in MS
- palpable 3rd or 4th HS : gallop
- palpable rub in pericarditis

d-Site : 5th Lt space just inside MCL in supine position - localized + bulge in systole

e-Character, area , rocking :

- normal : small gentle tap
- myocardial aneurysm (post infarction) : diffuse or dyskinetic
- double impulse : hypertrophic cardiomyopathy
- ventricular enlargement : Lt or Rt V.enlargement

f-Rhythm : regular -irregular (AF, or multiple extrasystole)

$\propto$ Rate (apical) : done in irregularity (AF or extrasystole) to determine pulsus deficit.



2-EPIGASTRIC AREA : pulsation are due to :

- RVE : from above with systolic retraction
- Aortic : from below in :
 - normal in thin people
 - causes of prominent arterial pulsation (esp. AR)
- Hepatic : from Rt. hypochondria, expansile (bimanual examination), associated with tender hepatomegaly - in :
 - normal thin people
 - TR, TS
 - pericardial disease : constrictive pericarditis - pericardial effusion

3-LEFT PARASTERNAL AREA :

- Pulsation "parasternal heave" : RV ++
- hyperdynamic : RV volume overload (TR & PR)
- heaving : RV tension overload (PS & pulmonary hypertension)
- Thrill : VSD (systolic)

4-RIGHT PARASTERNAL AREA :

Pulsation : RA ++ - huge left atrium - aneurysm of aorta

5-1st AORTIC AREA :

- Pulsation
- Thrill : AS (systolic + propagated to neck)
- Sound : diastolic shock = palpable A2 = syphilitic AR, hypertension, coarctation

6-PULMONARY AREA :

- Pulsation
- Thrill : PS (systolic) & PDA (continuous)
- Sound : diastolic shock = palpable S2 "P2" on P..area in pulmonary hypertension.

7-LEFT INFRACLAVICULAR AREA :

Thrill : PDA (continuous systolic & diastolic)

8-NECK "carotids" : ⇒ thrill

- Propagated from heart base : AS accompanied by thrill over heart base
- Initiated in carotid itself : AR - no thrill over heart base -

✎ **Tracheal tug** : patients chin slightly raised, the tips of index and thumb are placed below cricoid cartilage with slight pressure upwards ⇒ sudden jerky downward pull of trachea (tug) can be felt with each beat heart in aortic aneurysm involving bronchus.

PERCUSSION



Rules of percussion

-**Heart** : heavy percussion (4-5 cm depth) - except bare area, light to detect emphysema

-**Lung** : light percussion, except back heavy percussion

-**Abdomen** : light percussion except upper border of liver (heavy -1 cm depth)

-Rules of percussion :

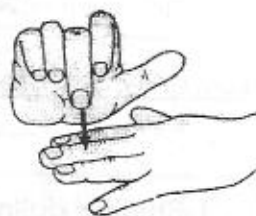
1-Percussed finger (pleximeter) is placed firmly against skin (coapted)

2-Percussion is done from wrist, not from elbow

3-Percussion is done from resonance to dullness (except Kronig's isthmus)

4-Percussion is done parallel to the border of dullness

5-Don't damp the note



technique of percussion

A-Hepatic dullness = Upper border of Liver

-Normally : 5th space MCL, 7th space MAL, 9th mid scapular

-If met higher : do tidal percussion (see chest)

B-Right border :

-Normally : no dullness on Rt. side of sternum (2 spaces higher than upper border of liver)

-Dullness : Rt atrial ++, peric. effusion, chest causes, elevated diaphragm (subphrenic abscess)

C-Upper border "base" :

a-1 st aortic area	b-Pulmonary area
normally resonant - dullness occur in :	normally : resonant - dullness occur in :
1-Aortic dilatation (pulsation) Post stenotic dilatation (AS) no pulsation	1-Pulmonary artery dilatation (pulsation) Post stenotic dilatation (PS) : no pulsation
2-Pericardial effusion : ask patient to sit down (dull change to resonant - shifting dullness)	
3-Pleural effusion, chest causes, elevated diaphragm (subphrenic abscess)	

D-Waist of heart : 3rd Lt space

-Normally : 1/2 dullness of normal apex - Up to 2 f. dullness.

-Dullness = obliteration of waist :

-Lt. atrium ++ (better seen in X ray)

-Pl. effusion, chest causes

-P. artery dilatation

-Hilar LN

E-Left border : "P. area, waist, outside apex"

-Normally : no dullness outside apex

-Dullness outside apex :

pericardial effusion, chest wall, pleural or lung disease

F-Bare area of heart : only area by light percussion

-Definition : area of heart not covered by lung tissue (cardiac notch)

-Site : 4th & 5th spaces between midline & parasternal line

-Value : normally dull (impaired note)

-increased dullness : RV enlargement & pericardial effusion - lung collapse

-resonant : emphysema, pneumothorax

G-Lower 1/3 of sternum : normally resonant - dullness occur in RV ++

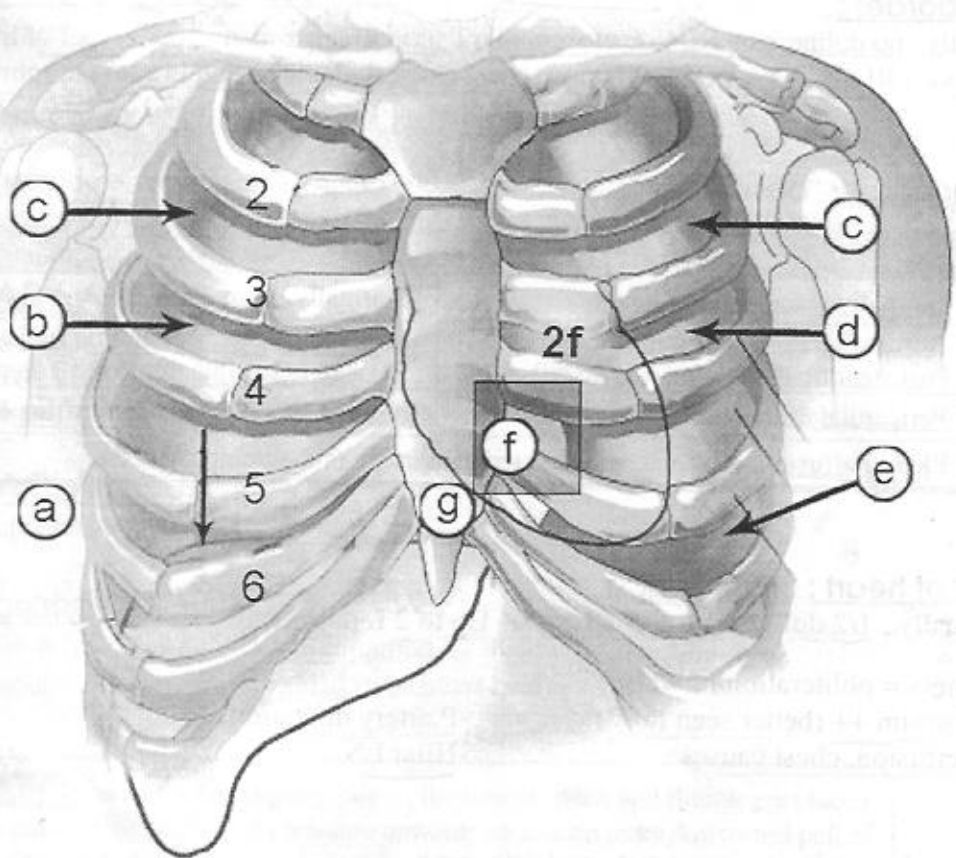
1-**Shifting dullness :**

-Definition : dullness on P. area while patient lye flat which disappear on sitting up

-Cause : pericardial effusion

2-**Area normally dull :** bare area - waist (2 fingers)

Heart Percussion



a-Hepatic dullness

b-Right border

c-Upper border "base" : A1 - P

d-Waist

e-Left border

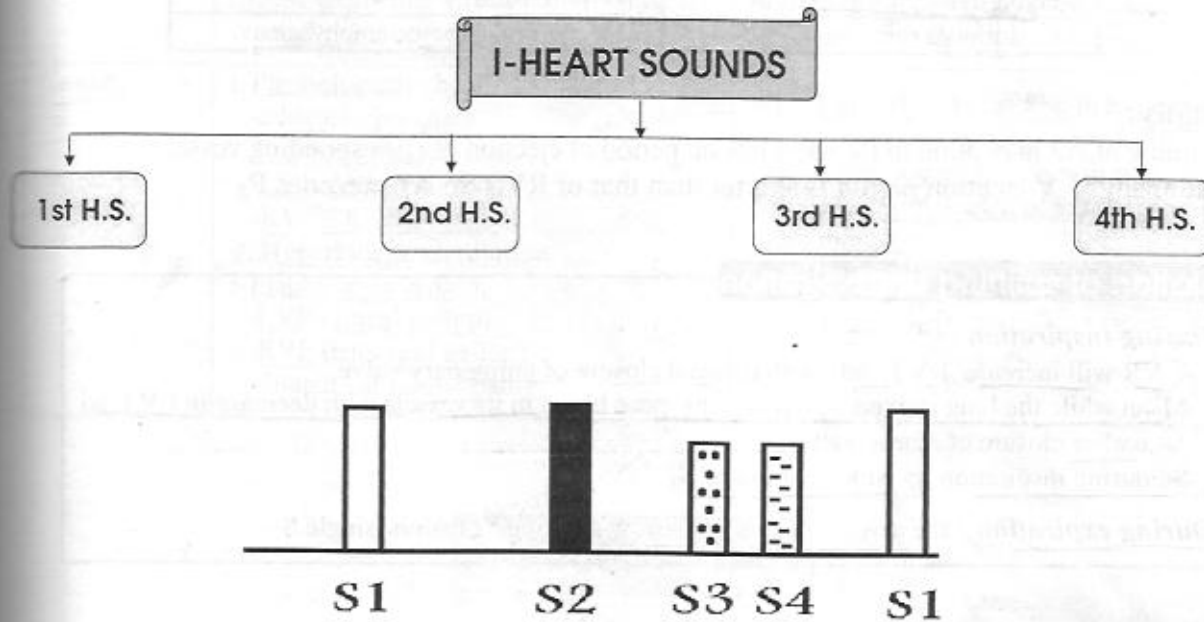
f-Bare area

g-Lower 1/3 of sternum

AUSCULTATION

Auscultatory Findings $\Rightarrow$ 1-Heart sounds 2-Added sounds 3-Murmurs

$\Rightarrow$ Search for bilateral fine basal crepitations over lung bases in LVF



1st Heart Sound "S1"

Cause : 2 components, heard at onset of systole

1-Valvular : closure of A-V (mitral & tricuspid) valves

2-Muscular : early ventricular contraction vibrations of chorda tendinae & papillary muscles producing transient vibrations

Accentuated S ₁	Weak (muffled) S ₁
1-MS - TS	1-MR - TR - calcified MS
2-Hyperdynamic circulation	2-Impaired myocardial contractility (HF, M. infarction, myocarditis)
3-Systemic hypertension	3-Hypotension
4-Short P-R interval (tachycardia, nodal rhythm, WPW)	4-Long P-R interval (bradycardia, heart block)
5-Children & thin chest	5-Mechanical (causes of absent apex)

$\propto$ **Variable S1 intensity** : due to variable P-R interval $\Rightarrow$ AF - extrasystoles - complete heart block

2nd Heart Sound "S2"

Cause : closure of semilunar (aortic & pulmonary) valves, heard at onset of diastole

-Over aortic area : S₂ is single (A₂ only heard)

-Over pulmonary area : S₂ is split (A₂ followed by P₂)

$\propto$ -A. component is heard all over heart (including apex) while P. component is heard over P. area

-In P. hypertension S₂ is closely split

-Intensity Of S₂:

Intensity of each component of S₂ depends on closing pressure in corresponding vessel

Accentuated S ₂	Weak (muffled) S ₂
1-↑ A ₂ in systemic hypertension ↑ P ₂ in pulm. hypertension	1-↓ A ₂ in AS & AR ↓ P ₂ in PS & PR
2-Hyperdynamic circulation	2-Hypotension
3-Children & thin chest	3-Mechanical : obese, emphysema

-Splitting :

- Timing of A₂ in relation to P₂ : depends on period of ejection of corresponding vessel
- Normally : LV ejection period is shorter than that of RV - So A₂ precedes P₂

Relation of splitting to respiration**During inspiration :**

- ↑ VR will increase RV Load, with delayed closure of pulmonary valve
- Meanwhile the lung is expanded & retains more blood in its vessels with decrease in LV load
⇒ earlier closure of Aortic valve
- So during inspiration ⇒ wide splitting of S₂

During expiration : the reverse occurs ⇒ narrow splitting or fusion (single S₂)

-Causes of wide splitting of S₂ : delayed P₂ in PS - RBBB - VSD

-Causes of wide fixed splitting of S₂ : "unaffected by respiration" ⇒ ASD

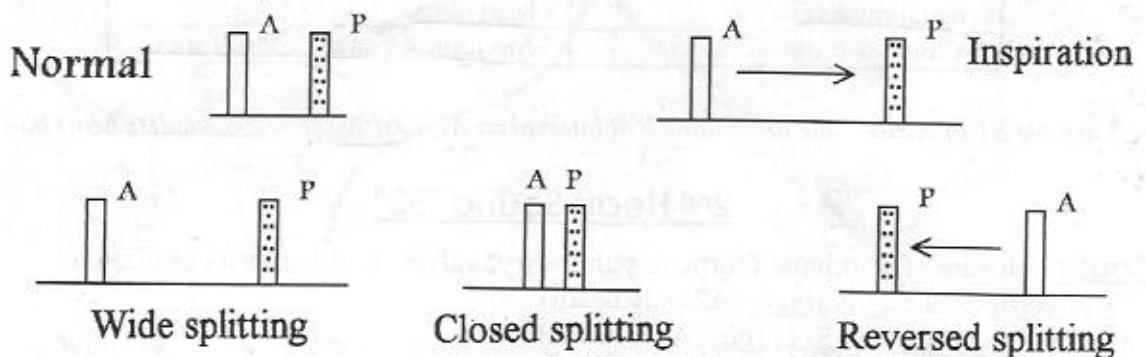
-Reversed "paradoxical" splitting :

-Definition : delay of A₂ to come after P₂ → reversal of relation to respiration. i.e. splitting closes during inspiration & widens during expiration

-Causes : delayed A₂ in AS - LBBB - PDA

-Causes of single S₂ :

- 1-Synchronous A₂ & P₂ : single ventricle
- 2-Faint P₂ (A₂ only heard) : PS (alone or with F4)
- 3-Faint A₂ (P₂ only heard) : AS



3rd & 4th HS "S3, S4"

	S3	S4
Time	Early <i>diastolic</i> sound heard shortly after S ₂ (Lub-dup-dum)	Late <i>diastolic</i> (presystolic) sound heard just before S ₁ (da-lub dup)
Mechanism	Excess ventricular vibrations (blood gush in ventricle after opening of A-V valve)	Forcible atrial contraction # ventricular end-diastolic pressure (so absent in AF)
Causes	1-Physiological : healthy young adults -athletes - pregnant 2-Volume overload : -LV : MR, AR, VSD -RV : TR, PR, ASD -Hyperkinetic circulation 3-Flabby myocardium : -LVF (apical gallop) -RVF (tricuspid gallop) -dilated cardiomyopathy	1-Tension overload leading to hypertrophy -LV : systemic hypertension & AS -RV : pulmonary hypertension & PS 2-Reduced compliance of ventricles : -M. infarction -hypertrophic cardiomyopathy

II-ADDED SOUNDS

Added sounds : term used to describe a variety of sounds distinct from the 4 heart sounds & murmurs

Systolic Clicks

a-Early systolic = ejection click

-Time : early systolic sound heard shortly after S₁ at the time of blood ejection from LV to aorta (or RV to pulmonary artery) at beginning of maximum ejection phase.

-Causes :

- 1-Aortic ejection click : valvular AS -systemic hypertension -aortic dilatation
- 2-Pulm. ejection click : valvular PS -pulm. hypertension -pulm. dilatation

b-Mid & Late systolic = mitral click

occur in mitral valve prolapse "Click - murmur syndrome" (commonest added sound)

Opening Snap

-Time : diastolic sound heard closely after S₂ (just before MS murmur)

-Auscultation : best heard medial to apex & along LSB in Lt.lateral position

-Cause : opening of rigid A-V cusps in MS (or TS)

-Value :

1-Denotes mobile non-calcific leaflets with no regurge

2-Severity of MS is inversely proportional to S₂ - OS interval i.e. short interval $\Rightarrow$ severe stenosis

GALLOP "triple rhythm"

-**Definition** : gallop = additional heart sound (S₃ or S₄ or both) + tachycardia

-**Types** :

1-Protodiastolic (ventricular) gallop = S₃ + tachycardia

2-Presystolic (atrial) gallop = S₄ + tachycardia

3-Summation gallop = S₃ + S₄ + tachycardia

Other Added Sounds

Added Sound	Cause	Character
1- <u>Pericardial rub</u>	Pericarditis	- <u>Superficial leathery continuous sound</u> - <u>Best heard at left sternal line over bare area</u> - Pt sitting up & leaning - <u>↑ by pressing stethoscope against chest wall</u> - <u>DD</u> : does not disappear on holding up respiration " <u>dd pleurisy</u> "
2- <u>Pericardial knock</u>	<u>Constrictive pericarditis</u>	- <u>Sudden halting of relaxing ventricles by rigid pericardium</u> - <u>Heard at same time of S₃</u>
3- <u>Tumor plop</u>	<u>Left atrial myxoma</u> = <u>Plunge of tumor in blood</u>	
4- <u>Clicks</u>	<u>Mitral valve prolapse</u> = <u>Sudden tension of prolapsed leaflet</u>	
5- <u>Metallic click</u>	<u>Metal prosthesis</u> = <u>Metallic sound</u>	

III-MURMURS**Description Of Murmur****1-Timing** ⇒ *timed against carotid pulse***a-Systolic** :

-Pan or holosystolic : MR, TR, VSD

-Ejection systolic : AS & PS

-Late systolic : mitral valve prolapse (MVP), hypertrophic cardiomyopathy (IHSS)

b-Diastolic :

-Early diastolic : AR & PR (Graham Steell murmur)

-Mid & late diastolic : MS, Carey Coomb's murmur (functional MS in Rh.F) & TS

c-Continuous :

-PDA (loudest in 2nd left interspace)

-Double valve lesion : AS/AR - MS/MR

-Arterio-venous fistula : systemic, pulmonary & coronary

-Others : after Blalock-Taussig operation, mammary souffle

-Venous hum : in children, continuous, above either clavicle (*no pathological significance*)

⌘ **Innocent murmurs** : *not associated with heart abnormality (as venous hum -functional murmur)*

2-Character

-Soft ⇒ all incompetent murmurs & flow murmurs - Harsh ⇒ in AS

-Rumbling : MS

-Machinery : PDA

-Musical : MR due to rupture papillary m. or chorda tendinae in myocardial infarction

-Sea-gull : AR due to rupture cusps in SBE

3-Intensity : presystolic accentuation in MS - crescendo & decrescendo in AS

4-Site & propagation

Lesion	Site of maximum intensity	Selective propagation
1-MS	Apex	Localized
2-TS	Tricuspid area	Localized
3-MR	Apex	Axilla & back, infraclavicular area
4-TR	Tricuspid area	Lower Lt & Rt sternal border, epigastrium
5-AS	A1	Apex & carotids
6-PS	Pulmonary area	Under left clavicle
7-AR	A2	Apex
8-PR	Pulmonary area	T. Area
9-VSD	Left parasternal area	Lower sternal edge - whole precordium
10-PDA	Left infraclavicular area	Pulmonary area
11-Aortic coarctation	Inter scapular area Anteriorly	

5-Relation to posture "position"

- Mitral murmurs : best heard in left lateral position
- Aortic murmurs : best heard on sitting leaning forward & expiring

6-Associated thrill

- Stenotic murmurs are harsh + marked thrill
- Regurge murmurs are soft + minimal thrill
- Functional murmur : no thrill

7-Relation to respiration

- Rt. Sided murmurs : ↑ by inspiration (Carvallo's sign) - due to ↑ VR & ↑ flow
- Lt. Sided murmurs : ↑ by expiration

8-Dynamic auscultation "maneuvers"

- Isometric exercise : ↑ MS, MR, & AR and ↓ in AS
- Squatting or leg raising : ↓ murmur of IHSS (both ↑ VR which fill ventricle & so ↓ obstruction) - murmur ↑ with standing

9-Grade - intensity "Levine grading system"

- Grade 1 : very faint - heard by an expert in optimum condition (quiet room - proper pt positioning)
- Grade 2 : faint - heard by non expert in optimum condition
- Grade 3 : moderate intensity - easily heard but no thrill
- Grade 4 : loud - with thrill
- Grade 5 : very loud - heard over wide area, with thrill
- Grade 6 : extremely loud - be heard without stethoscope

murmur with thrill

10-Type :

Organic murmur	Functional murmur
1-Usually loud	1-Usually faint
2-Usually long	2-Usually short
3-Usually harsh	3-Usually soft
4-May propagate to other areas	4-Localized
5-Associated with thrill + symptoms & signs	5-No thrill - no symptoms nor signs
6-Medical ttt has no effect	6-May disappear after ttt e.g. anemia

DIAGNOSIS OF CARDIAC DISEASES

I-Etiological Diagnosis

a-Rheumatic :

- | | |
|-----------------------------|--------------------------------|
| 1-Past history of Rhe fever | 3-Organic mitral stenosis |
| 2-Double valve lesion | 4-More than one valve affected |

b-Congenital :

- | | |
|-------------------------------|---------------------------------|
| 1-Young age | 3-Associated congenital anomaly |
| 2-Central cyanosis & clubbing | 4-Organic pulmonary lesion |

c-Others : ischemic -hypertensive -cardiomyopathy - systemic disease

II-Anatomical Diagnosis

a-Endocardial : valvular lesion. e.g. MS, AR

b-Myocardial :

- RV ++ : 1-Apex : outward, diffuse, systolic retraction 2-Epigastric & Lt parasternal pulsations
- LV ++ : Apex : outward & downward, localized, heaving or hyperdynamic with systolic bulge
- RA ++ : dullness to the Rt. side of sternum
- LA ++ : obliteration of cardiac waist (better radiological diagnosis)
- Pulmonary a. ++ : 1-Pulsation & dullness in P. area 2-Diastolic shock & Accentuated S2
- Aortic ++ : pulsation and dullness in 1st Aortic area

c-Pericardial : pericarditis - pericardial effusion

III-Functional Diagnosis

a-Compensation :

- Compensated
- Decompensated :

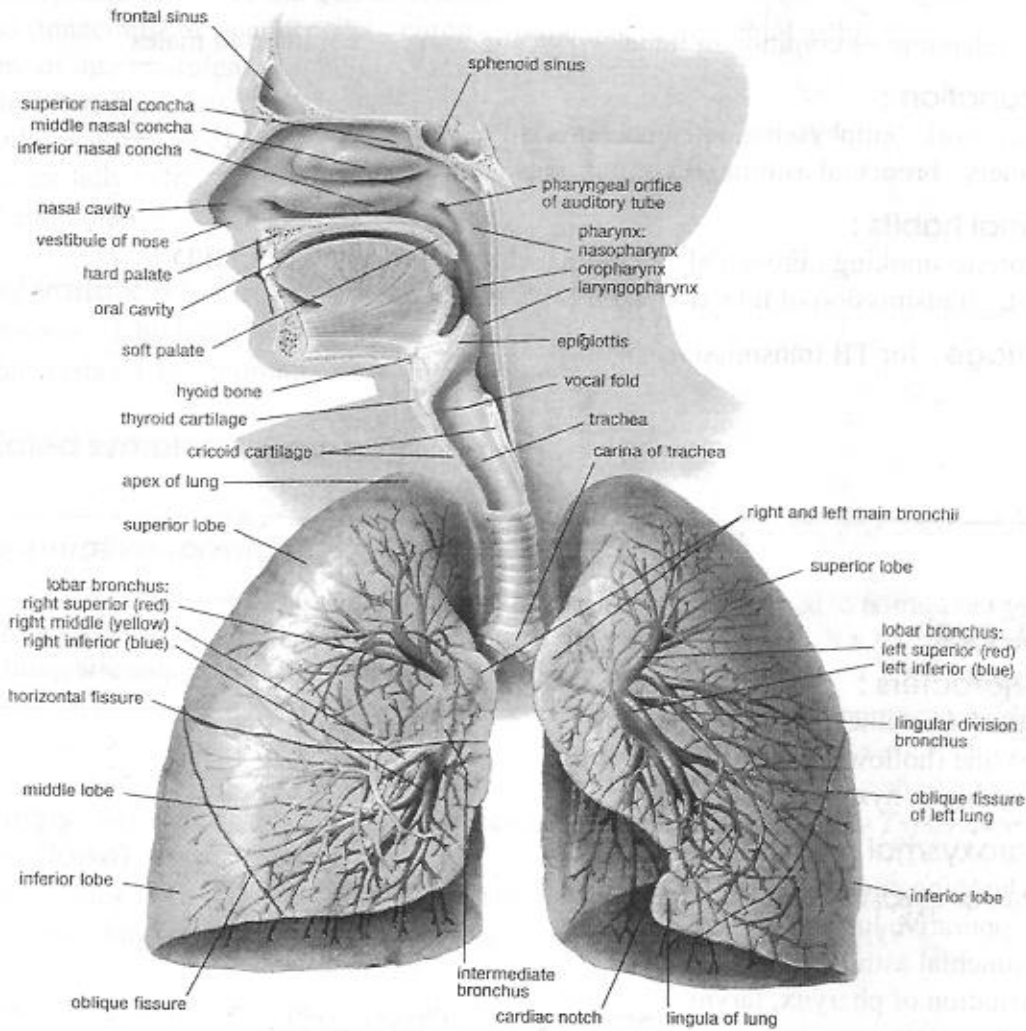
RSF : 1-Symptoms of systemic congestion	2-LL edema
3-Enlarged tender liver	4-Congested neck veins
LSF : 1-Symptoms of pulmonary congestion	2-Pulsus alternans
3-Apical gallop	4-Fine bilateral basal crepitations

b-Complications :

- | | |
|-----------------------|--------------------------------|
| 1-Arrhythmia e.g. AF | 2-Rheumatic activity & SBE |
| 3-Pulmonary infection | 4-Thromboembolism : hemiplegia |

3

CHEST



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HISTORY

PERSONAL HISTORY

- 1-Age : young : TB, adenoma -old : bronchial carcinoma
- 2-Sex : adenoma → common in females -Carcinoma → common in males
- 3-Occupation :
 - Dusty work : emphysema, pneumoconiosis
 - Farmers : bronchial asthma, *B. cor pulmonale*
- 4-Special habits :
 - Cigarette smoking : bronchial carcinoma, chronic bronchitis & COPD
 - Goza : transmission of infection, COPD
- 5-Marriage : for TB transmission

PRESENT HISTORY

I-Dry Cough :

1-Characters :

- brassy (metallic) in tracheal irritation
- bovine (hollow) in left RLN paralysis
- barking in hysterical

2-Paroxysmal :

- whooping cough
- suppurative lung syndrome (SLS)
- bronchial asthma
- irritation of pharynx, larynx

3-Precipitating & relieving factors : exertional cough in left sided HF

4-Diurnal variation : nocturnal : cardiac -early morning : bronchial asthma & bronchiectasis

5-Seasonal variation : allergy

Main causes of chronic cough : 1-Chronic bronchitis 2- Suppurative lung syndrome 3-TB

II-Expectoration :

1-Amount / 24h. : big (> 1 cup / day) in suppurative lung syndrome (SLS)

2-Colour :

- white : chronic bronchitis
- green : pyocyanous, anaerobic infection
- yellow : pyogenic infection
- black : cigarettes smokers, industrial cities

3-Odour : foul fetid $\Rightarrow$ SLS - infection (anaerobes, spirochetes, fusiform bacilli, fungi)

4-Diurnal variation : nocturnal $\Rightarrow$ heart -early morning $\Rightarrow$ bronchiectasis & Br.asthma

5-Character :

- frothy : acute pulmonary edema
- watery : hydatid cyst, alveolar cell carcinoma
- mucoid (tenacious) or mucus pellet : chronic bronchitis & bronchial asthma
- purulent or mucopurulent : bronchitis, bronchopneumonia, SLS
- chocolate "anchovy sauce" : amebic lung abscess
- nammular "coin like" : caseous material in TB
- red current jelly : Br. carcinoma, Friedlander's pneumonia
- rusty : altered blood in pneumonia

6-Postural variation "of cough and /or sputum" :

- lung abscess : $\uparrow$ by lying on healthy side
- bronchiectasis : $\uparrow$ by stooping foreword

7-Associated symptoms : wheezes

$\Rightarrow$ Suppurative (cavitary) Lung syndrome "SLS" :

Excessive expectoration of huge amount of fetid purulent sputum related to posture - causes are :

- | | |
|------------------|---------------------------------------|
| 1-Lung abscess | 3-Infected cystic lung |
| 2-Bronchiectasis | 4-Empyema with bronchopleural fistula |

III-Hemoptysis : expectoration of blood originating from below vocal cords - Types are :

a-Spurious (false) :

- Blood originating from above vocal cords -in false hemoptysis blood is on surface of sputum
- Causes $\Rightarrow$ bleeding gums (scurvy) - nasopharynx (inflammation, tumors, ulcers)

b-True : blood originating from below vocal cords

In true hemoptysis blood is *intermingled* with sputum - causes are :

- 1-Acute bronchitis
- 2-Pulmonary TB : blood streaked - frank
- 3-Pneumonia : rusty
- 4-Bronchiectasis : frank in bronchiectasis sicca hemorrhagica
- 5-Lung abscess
- 6-Bronchial adenoma & carcinoma : frank or red current jelly
- 7-MS, LVF, APE (pink frothy)
- 8-Pulmonary infarction

Ask about :

- *Description : amount of blood loss - frequency - ttt (blood transfusion)
- *Cause : bleeding from other orifices - DVT - anticoagulants

	<i>Hemoptysis</i>	<i>Hematemesis</i>
1-Before attack	chest, cardiac trouble	GIT (pain nausea, vomiting)
2-During attack	-coughing blood -bright red blood -mixed with air (frothy) -alkaline	-vomiting blood -coffee-ground (hematine) -mixed with food -acidic
3-After attack	blood tinged sputum for a while	melena and constipation
4-Examination	chest, cvs signs	GIT signs

IV-Dyspnea :

- 1-Relation to : exertion, posture, time (nocturnal)
- 2-Ppt & relieving factors
- 3-Associated symptoms : wheezes, chest pain

-Causes of paroxysmal dyspnea :

1-Hysterical 2-Laryngismus stridulus 3-Mediastinal syndrome 4-PND 5-Myasthenic crisis 6-Br. asthma

-Causes of paroxysmal dyspnea + wheezes : bronchial asthma & its DD (cardiac, uremic)**-Causes of exertional dyspnea :**

- 1-↓ ventilation : obstruction (COPD) - restriction (pl. effusion, pneumothorax)
- 2-↓ diffusion : fibrosis - congestion (L. sided. failure cardiac asthma & APE)

-Causes of acute dyspnea :

- 1-↓ ventilation : obstruction ⇒ Br. asthma, FB -restriction ⇒ pneumothorax
- 2-↓ diffusion : congestion ⇒ c. asthma, APO
- 3-↓ perfusion : pulmonary embolism

V-Chest Pain : *pulmonary causes of chest pain***1-Pleural pain :**

- pleurisy : 1^{ry} or 2^{ry} to lung disease (pneumonia) : stitching, referred to abdominal wall (T6-T11) shoulder (C3, C4), arm (C8- T1 in apical pleurisy)
- pneumothorax : acute tearing chest pain
- pulmonary infarction : acute pain + hemoptysis + dyspnea

2-Muscular pain : chronic cough**3-Tracheal pain :** tracheitis**VI-Wheezes :** *musical sound produced by passage of air through narrow bronchi***1-Continuous :** COPD**2-Paroxysmal :** bronchial asthma - ask about : time of attack, precipitating & relieving factors.**VII-Constitutional "Toxic" Symptoms :**

- Night fever - night sweats - loss of weight - loss of appetite
- Suggestive of : TB, SLS, malignancy

VIII-Systemic Congestion Symptoms :

- 1-Ascites & edema
- 2-Hepatic congestion : pain in right hypochondrium
- 3-GIT congestion : dyspepsia

IX-Cyanosis**X-Pressure Symptoms : for mediastinal syndrome**

- Dyspnea (paroxysmal - on lying on the back)
- Dysphagia
- Hoarseness of voice : RLN pressure
- UL ischemia

XI-Symptoms of other Systems : CVS, Neuro, GIT**PAST HISTORY****a-Disease** : when ?, investigations ? recurrence ? ttt ?

- | | |
|--------------------------------|--|
| 1-TB (sanatorial ttt, anti TB) | 2-DM |
| 3-Infection : pneumonia | 4-Rh. fever : pleurisy & pl. effusion |
| 5-Dusty work : pneumoconiosis | 6-Bilharziasis |
| 7-Bronchial asthma | 8-Amebic dysentery : amebic lung abscess |

b-Trauma, accidents :

- Coma : for lung abscess (aspiration of septic material)
- Chest trauma : pneumothorax.

c-Drug Intake : types & duration**FAMILY HISTORY**

- 1-Similar condition in family : B. asthma (allergy), TB
- 2-Positive consanguinity - common diseases : DM, hypertension, coronary HD

GENERAL EXAMINATION

VITAL SIGNS

1-Temperature :

- High grade fever : pneumonia, lung abscess
- Low grade fever : TB, bronchial carcinoma

2-Pulse :

- Water hammer pulse : emphysema (VD)
- Unequal pulse volume : thoracic inlet syndrome

3-Blood pressure :

- Hypertension : polyarteritis nodosa causing bronchial asthma
- Hypotension : miliary TB causing Addison's disease

4-Respiratory rate :

a-Rate :

- Normal 12-20 /min (pulse : resp. ratio 4 : 1) - count rate while holding pt. wrist (distract his attention)
- ↑ rate = tachypnea : all causes of acute dyspnea & fever - In pneumonia pulse : resp. ratio is 1:1
- ↓ rate = bradypnea : ↑ ICT, inhibition of RC (morphine, alcohol)

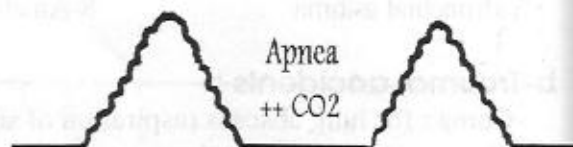
b-Rhythm : normally, respiration is regular - periodic breathing include :

-Cheyne - stokes breathing :

- Definition : a period of apnea for 1/2 min., followed by gradual hyperpnea then gradual hypopnea till apnea occur & so on.

- Causes : ↓ sensitivity of RC to CO₂ as in :

* elderly (during sleep) * inhibited RC : cerebral atherosclerosis, resp. failure, narcotics, ↑ ICT



-Biot's (Ataxic) breathing :

- Definition : unpredictable irregularity breaths may be shallow or deep & stop for short periods.
- Cause : Resp. depression & brain damage at medullary level.

c-Depth :

- Hyperpnea (deep) : psychogenic - acidosis "Kussmaul's respiration" in DM & CRF
- Hypopnea (shallow) : pneumonia & HF (rapid, shallow) -inhibited RC by drugs (slow, shallow)

d-Type : normally :

- In males abdomino thoracic
- In females thoraco abdominal

GENERAL EXAMINATION

1-General Observation :

- Mentality : cloudy consciousness in respiratory failure
- Body built :
 - obese : chronic bronchitis, Pickwickian syndrome with cor pulmonale
 - thin : emphysema, pulm. TB
 - cachectic : bronchial carcinoma
- Decubitus :
 - orthopnea : in severe emphysema - ascites in cor-pulmonale
 - lateral decubitus : lung abscess & pleurisy (on diseased side)

2-Face "appearance" : toxic in TB, suppurative lung syndrome

3-Skin :

- Erythema nodosum : red, tender indurated swelling from mm to cm
 - site : chin of tibia, thighs, knees, extensor surface of arms & forearms
 - causes : Iry TB, sarcoidosis
- Metastatic tumor nodules : bronchial carcinoma
- Rash of SLE : in pleurisy, pleural effusion, lung fibrosis
- Lupus vulgaris : TB

4-Eyes :

- Puffy lids : chronic cough, cor pulmonale
- Conjunctiva :
 - subconjunctival hemorrhage in chronic cough
 - phlyctenular conjunctivitis in TB
- Blue sclera : TB
- Pupils :
 - Argyl Robertson in syphilis with pulmonary hypertension
 - Horner's syndrome : Pancoast tumor, mediastinal syndrome
- Fundus : choroidal nodules in miliary TB - papilledema in hypercapnea
- Jaundice

Chest causes of Jaundice

- 1-Hepatocellular : cor pulmonale : liver congestion - rifampicin (anti TB) - associated viral hepatitis
- 2-Hemolytic : pulmonary embolism
- 3-Obstructive : bronchial carcinoma (liver metastases)

5-Nose & Cheeks :

- Working ala nasi : severe dyspnea in pneumonia
- Plethoric face : polythycemia in COPD

6-Mouth & Throat :

- Mouth odour : fetid odour in SLS
- Tongue : central cyanosis

Chest causes of cyanosis

- 1-Peripheral : Rt. sided HF (B. cor pulmonale) - SVC thrombosis
- 2-Central : COPD (hypoxic cor pulmonale) - pulmonary fibrosis - pulm. embolism
- 3-Both central & peripheral : massive pulmonary embolism

7-Neck :

- Enlarged cervical esp. scalene LN : TB, sarcoidosis, bronchial carcinoma.
- Congested neck veins :
 - pulsating : RVF (cor pulmonale) - $\uparrow$ intrathoracic pressure : pneumothorax, emphysema
 - non pulsating : mediastinal syndrome (SVC obstruction) - severe RVF (cor pulmonale)

8-Extremities : UL & LL

- Flapping tremors (astrexis) : respiratory failure
- Clubbing :
 - toxic : suppurative lung syndrome, fibroid TB, Br. carcinoma
 - hypoxic : COPD, interstitial fibrosis
 - unilateral : Pancoast tumor
- Edema LL

Chest causes of LL edema

- 1-RVF : due to cor pulmonale
- 2-Hypoalbuminemia :
 - lost purulent sputum in SLS
 - frequent aspiration of empyema
 - nutritional : anorexia ($\downarrow$ protein intake)
- 3-Nephrotic syndrome : renal amyloidosis in long standing SLS
- 4-Renal regulation in COPD : $\uparrow$ PCO₂ leads to compensatory $\uparrow$ NaHCO₃ reabsorption from kidney, with Na & H₂O retention

ABDOMINAL EXAMINATION**a-Hepatomegaly : may occur due to**

- | | |
|---|--|
| 1-Cor pulmonale : Bilharzial, hypoxic | 2-Amebic liver abscess |
| 3-Secondaries from bronchial carcinoma | 4-Fatty changes : chronic toxemia |
| 5-Amyloidosis : chronic toxemia | 6-Associated liver disease : viral hepatitis |
| 7-Downward displacement in emphysema (palpable liver) | |

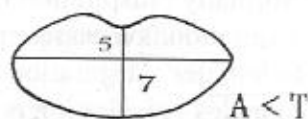
b-Ascites : cor pulmonale "Bilharzial, hypoxic"**c-Splenomegaly :**

- 1-Cor pulmonale : Bilharzial - Hypoxic (with cardiac cirrhosis)
- 2-Miliary TB
- 3-Sarcoidosis
- 4-Amyloidosis

INSPECTION

a-Normal chest :

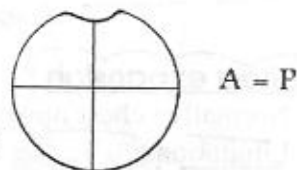
- Shape : elliptical & symmetrical
- Antro-posterior : transverse diameter 5 : 7
- Ribs : oblique & subcostal 90° or less



b-Symmetrical deformities :

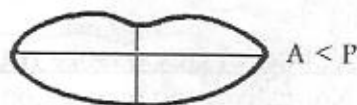
1-Barrel (emphysematous) chest : *COPD*

- Shape : barrel & symmetrical
- Antro-posterior diameter > transverse diameter
- Ribs : horizontal, wide interspaces, transverse raised shoulders
+ limited chest expansion with overwork accessory ms
"marked intercostal retraction"
- Subcostal angle wide > 90°



2-Flat chest "alar" :

- Causes : fibrosis as TB
- Decreased AP diameter + winged scapula



3-Funnel chest "pectus excavatum" : congenital

- Inward depression of lower part (or the whole) sternum
- Effect : compress RV with ischemia of lung
- May be acquired in shoe makers

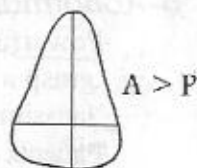


4-Pigeon's chest "pectus carinatum" :

- Causes : bone softening disease ⇒ Rickets, Marfan syndrome
- Prominent sternum with foreword protrusion, $\uparrow$ A-P > transverse diameter

⊗ Rachitic chest : "active Rickets" ⇒ pigeon chest +

- 1-Rachitic rosary : transient hypertrophy of costo-chondral junction
- 2-Harrison's sulcus : permanent groove at line of diaphragmatic insertion into ribs



5-Thoracic kyphoscoliosis :

- Curved spine & chest shows the corresponding deformities
- Effect : cor pulmonale - difficult interpretation of lung field in x-ray

c-Asymmetrical deformities : normal chest is symmetrical

1-Unilateral retraction (flattening) : fibrosis - collapse

2-Unilateral bulge :

- Pleura : PL effusion, pneumothorax, empyema necessitans
- Lungs : unilateral emphysema
- Cardiac : precordial bulge (RV ++, pericardial effusion)
- Chest wall : SC emphysema

} differentiated by movement
(diseased part moves less)

II-RESPIRATORY MOVEMENT :

1-Type of respiration :

- Normally : inspiration is affected by contraction of intercostal muscles & diaphragm, while expiration is a passive process, dependent on elastic recoil of lungs
- In females : respiration is predominantly thoracic (thoracoabdominal)
- In males : respiration is predominantly abdominal (abdomino thoracic)
- Abdominal respiration : intercostal paralysis (polio) - COPD - pleural pain - ankylosing spondylitis
- Thoracic respiration : phrenic nerve paralysis - abdominal distention (ascites, pregnancy)

2-Chest expansion :

- Normally : chest moves freely with respiration & maximum chest expansion is 4 - 6 cm
- Limitation :
 - bilateral : in bilateral chest disease e.g. emphysema
 - unilateral : on the affected side e.g. fibrosis, collapse

3-Action of accessory muscles :

Normally $\Rightarrow$ no over action of accessory muscles of respiration - over action occur in :

a-Abnormal inspiratory movement :

- Contraction of neck muscles (trapezii, sternomastoids & scalenus muscles) with lift of the whole thoracic cage (thoracic up lift)
- Exaggerated indrawing of intercostal spaces, suprasternal & supraclavicular fossae
- Causes : obstructive airway disease (COPD - Br. asthma laryngeal or tracheal obstruction) due to inadequate pulmonary ventilation .

b-Abnormal expiratory movements :

- Powerful contraction of abdominal muscles & latissimus dorsi - Patient sit upright & grasp a bed table or back of a chair. This enables him to fix shoulder girdle, so that latissimus dorsi can be used for approximating ribs & augmenting expiratory efforts.
- Patients can be seen to purse their lips with every expiration to keep intrabronchial pressure about that of surrounding alveoli & prevents collapse of bronchial wall.
- Causes : when elastic recoil of lungs is insufficient to complete expulsion of air from alveoli (e.g. emphysema) or obstruction in expiratory airways (e.g. br. asthma & bronchitis)

4-Littin's sign :

- Normally there is retraction of lower intercostal space on chest sides due to diaphragmatic descent
- It increase in obstructive lung disease
- It is lost in obesity, pleural effusion, diaphragmatic paralysis (Littin's sign)

III-PULSATION OF DIFFERENT AREAS : see cardiology

⌘ In cor pulmonale, RVE is diagnosed by epigastric pulsation (from above) or left parasternal pulsation

IV-POSITION OF MEDIASTINUM :

a-**Apex** : as CVS - value of apex in chest cases :

1-**Shifted** :

- pulling of apex : fibrosis & collapse -pushing = pleural effusion, pneumothorax.
- upward : diaphragmatic paralysis

2-**Absent apex** : emphysema, left sided Pl. effusion or pneumothorax

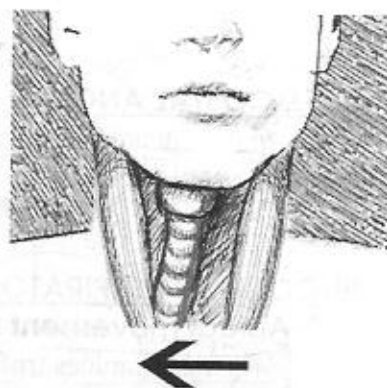
3-**In corpulmonale** : RVE (shifted out + diffuse)

4-**Congenital dextrocardia** : Kartagener syndrome "immotile cilia syndrome"

- absent frontal sinuses or frontal sinusitis -congenital bronchiectasis
- decrease ciliary movement : infertility -dextrocardia

b-**Trachea** : "sternomastoid (Trail's) sign"

in thin patients sternomastoid tendon appears more prominent
on side of tracheal shift due to displacement of trachea behind it.



V-CHEST WALL LESION "combined inspection & palpation"

1-**Dilated veins** :

- cause : SVC obstruction "fill from above downward"
- dd : visible veins

2-**SC emphysema**

- cause : after tracheostomy, after pneumothorax (2nd to intercostal catheter)
- diagnosis : chest swelling with crackling sensation

3-**Scars, ulcers, pigmentation** :

4-**Bony cage** :

- sternum : congenital deformity
- ribs : oblique normally - more oblique in fibrosis - horizontal in emphysema

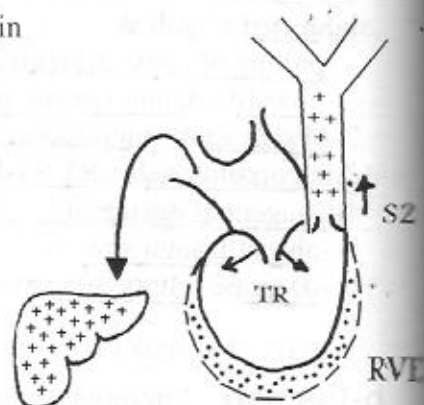
5-**Examine breast & axilla**

PALPATION

I-CONFIRM PULSATION : esp. epigastric pulsation of RV origin

④ Signs of cor pulmonale :

- 1-Epigastric pulsation of RV origin
- 2-Tender pulsating liver
- 3-Pulmonary hypertension ($\uparrow$ S2)
- 4-Tricuspid regurge



II-SUBCOSTAL ANGLE :

- normally : acute to right angle ($70^\circ - 90^\circ$)
- obtuse angle : emphysema , upper abdominal swelling & ascites

III-CONFIRM RESPIRATORY MOVEMENT :

1-Apical movement : 2 ways

- Palms over apices (infraclavicular area)
- Hand over both shoulders during respiration (behind sitting pt.)

2-Chest expansion : compare displacement from mid line by both hands in upper chest , middle chest , lower chest

3-Basal expansion : compare displacement from mid line by both hands in infrascapular area at level of T 10



IV-TACTILE VOCAL FREMITUS (TVF) :

-Definition : palpable vibration of vocal cords transmitted through respiratory passage to be felt on chest wall .It is done by applying hand on chest wall and ask patient to repeat "99" or in Arabic "44"

-Technique :

- Compare symmetrical part Rt to Lt by $\rightarrow$ palm of hand or
- In MCL, MAL, back $\rightarrow$ side of hand or
- In upper, middle & lower areas of chest $\rightarrow$ thenar & hypothenar

-Normally :

- Equal on both side
- TVF is increased in Rt 2nd space parasternal line (Rt upper lobe) because :
 - trachea is in contact with Rt. lung apex
 - Rt. apical bronchus is more superior

-Causes of increased TVF :

- 1-Consolidation
- 2-Cavity if : big, superficial & surrounded by consolidation
- 3-Collapse or fibrosis if associated with patent bronchus (rare)

-Causes of decreased TVF :

- 1-All other chest diseases
- 2-Weak feeble person

V-PALPABLE ADVENTITIOUS SOUND :

- Palpable ronchi "ronchus fremitus" in bronchitis
- Palpable rub "rub fremitus" in pleurisy
- Palpable crepitations

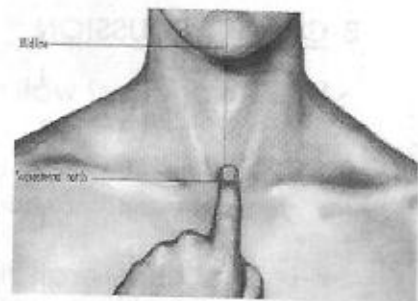
VI-LOCALIZED TENDERNESS :

- Over ribs : fracture, inflammation, tumors, Tietz syndrome (costo-chondritis) of unknown cause
- Over interspaces : myalgia, neuralgia, pleurisy, empyema
- Over sternum : leukemia
- Over right base : amebic lung abscess

VII-CONFIRM POSITION OF MEDIASTINUM :

a-Apex : as CVS sheet

b-Trachea : normally central - seen in suprasternal notch

**Causes of mediastinal shift :**

- 1-Shift of apex alone : cardiomegaly & dextrocardia - moderate effusion
- 2-Shift of trachea alone : superior mediastinal tumor - retrosternal goiter
- 3-Shift of trachea & apex :
 - pulled to same side : fibrosis, collapse
 - pushed to opposite side : effusion, pneumothorax

PERCUSSION

Types of percussion :

- 1-Heavy : heart -hepatic dullness -back (thick muscles) : using 1 finger, 2 fingers , all fingers
- 2-Light : lung -lower border of liver - bare area of heart

Grades of percussion notes :

a-Resonance :

- 1-Normal resonance : over normal lung, free abdomen
- 2-Hyperresonance : emphysema
- 3-Tympanitic resonance = air in pneumothorax - emphysematous bulla - empty stomach

b-Dullness :

- 1-Slight dullness (impaired note) : normally over scapula -in minor consolidation, collapse, fibrosis
- 2-Dullness : normally over heart, liver -in massive consolidation, collapse, fibrosis
- 3-Stony dullness : over pleural effusion (rising to axilla)

A-HEART PERCUSSION : heavy - see cardiology

B-CHEST PERCUSSION : comparative percussion "Rt to Lt"

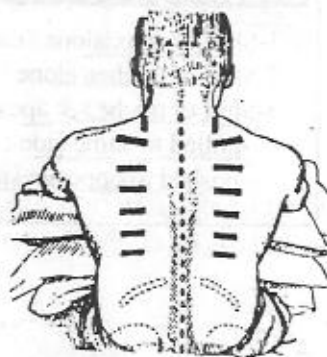
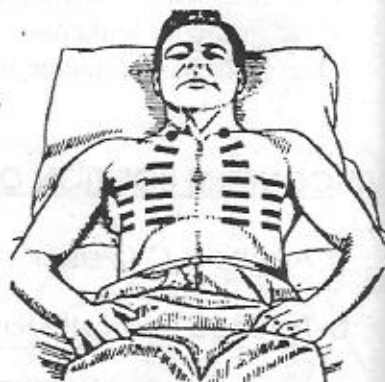
1-Anterior chest wall "light"

- Parasternal line (PSL) - Mid clavicular line (MCL)
- Start from clavicle to 6th space (except left 4th & 5th space)
- to anterior axillary line in order to avoid heart

2-Lateral chest wall "light"

- Anterior axillary line (AAL)
- Mid axillary (MAL)
- Posterior axillary (PAL)
- Start from 4th to 8th space
- Scapular line (SL) - Paravertebral line (PVL)
- Start from apex to 10th space

-Lower level of lung dullness : below 5th space in Rt MCL :
in emphysema, pneumothorax
-Higher level of lung dullness : pleural or pulmonary disease

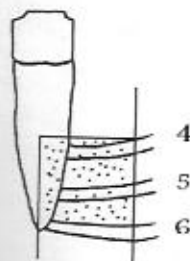


C-PERCUSSION OF SPECIAL AREAS

1-1st intercostal space : direct percussion over clavicle

2-Bare area of heart :

- Definition : area of heart not covered by lung tissue
- Site : 4th & 5th space between midline & PSL
- Value : -normally dull by light percussion
 - if resonant : emphysema, pneumothorax
 - if dull : RV ++, pericardial effusion



3-Hepatic dullness :

- Normally : upper border in 5th space Rt MCL
- Lower level of dullness (below 5th space Rt MCL) : emphysema
- Higher level : causes of right basal dullness

Tidal percussion :

- Definition : while percussing for hepatic dullness, after getting the 1st dull space, ask patient to take deep inspiration & re-percuss again {can be done from back - in scapular line}
- if dullness persist : supradiaphragmatic = - ve TP
- if dullness change to resonance : infradiaphragmatic = + ve TP

-Value :

- 1-Differentiate between supra & infradiaphragmatic dullness
- 2-Indicate that the diaphragm is freely mobile
- 3-Reversed TP = diaphragmatic paralysis

4-Splenic dullness :

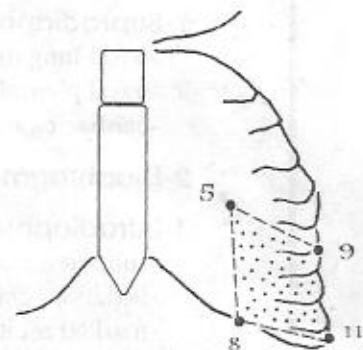
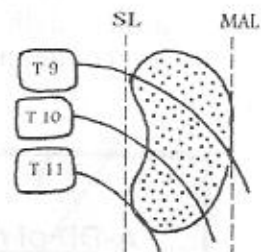
MAL (laterally) & scapular line (medially)

5-Traub's area :

-Definition : an area of tympanitic resonance overlying air bubbles in fundus of stomach

-Boundaries :

- Upper border : lower border of Lt lung
- Lower border : left costal margin
- Right border : left border of liver
(Lt. 5th space MCL → 8th costal cartilage MCL)
- Left border : anterior border of spleen
(Lt. 9th MAL → 11th MAL)

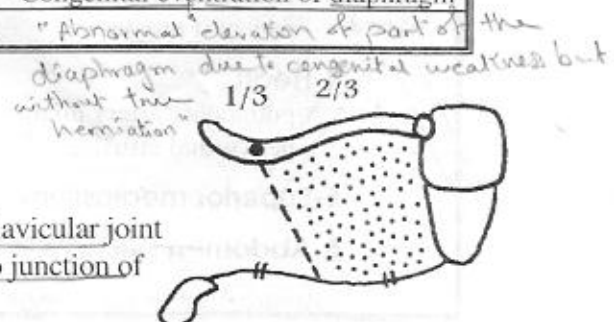


	Dullness of Traub's area	↑ size of Traub's area
1-Stomach	full stomach or gastric tumors	dilated stomach
2-From above	-Lt basal lung disease (consolidation, bronchiectasis & tumor) -Lt pleural effusion -Pericardial effusion	-Lt basal lung disease (collapse or pneumonectomy) -Emphysema -Pneumothorax
3-From left	Splenomegaly	Splencetomy
4-From right	Hepatomegaly (enlarged left lobe)	Shrunk liver
5-From below	Elevated diaphragm (ascites, tumor & pregnancy)	-Pneumoperitoneum -Congenital eventration of diaphragm
6-Others	Situs inversus totalis	"Abnormal elevation of part of the diaphragm due to congenital weakness but without true herniation"

6-Kronig's isthmus :

-Definition : a band of resonance overlying lung apex

- Medial : line connecting spine of C7 vertebra to sternoclavicular joint
- Lateral : line connecting mid point of spine of scapula to junction of medial 2/3 with lateral 1/3 of clavicle
- Posterior : medial 1/2 of spine of scapula



-Detected by : light percussion from dullness to resonance

-Causes of dullness in Kronig's isthmus $\Rightarrow$ apical lesion :

- 1-Apical lung lesions : TB - Friedlander's pneumonia - fibrosis - collapse
- 2-Apical lung tumor : Pancoast tumor
- 3-Apical pleural lesions : pleural thickening

D-SPECIAL PERCUSSION TESTS :

1-Tidal percussion

2-Shifting dullness :

- Value : differentiate between PL effusion & hydropneumothorax
- Technique :
 - we percuss in 3 plains while changing patient position
 - if level of dullness persist $\Rightarrow$ pleural effusion
 - if level of dullness change $\Rightarrow$ hydropneumothorax

Important Differential Diagnosis

A-DD of right basal dullness :

1-Supradiaphragmatic causes : - ve TP

- basal lung disease : consolidation, bronchiectasis, collapse, fibrosis & cavitation
- basal pleural disease : effusion, empyema, hydropneumothorax & Pl. fibrosis
- cardiac causes : dextrocardia, huge pericardial effusion & huge cardiomegaly

2-Diaphragmatic causes : reversed TP = diaphragmatic paralysis

3-Infradiaphragmatic causes : + ve TP

- subphrenic abscess, amebic liver abscess
- hepatomegaly, abdominal tumors
- marked ascites, pregnancy

4-Chest wall causes : tumors of skin, subcutaneous tissue, muscles & ribs

B-Causes of dullness in 2nd left space :

1-Chest wall : e.g. tumor -

2-Pleura : apical pleural thickening - massive pleural effusion

3-Left lung :

- consolidation of Lt upper lobe, specially due to TB
- collapse of Lt upper lobe
- fibrosis of Lt upper lobe
- pancoast tumor

4-Heart :

- pulmonary artery dilatation
- pericardial effusion

5-Superior mediastium : thymus, thyroid & dermoid cyst

6-Abdomen : ascites & pregnancy - these will raise diaphragm & subsequently heart

AUSCULTATION

Chest

a- Site :

- 1-Mid clavicular line : supra mammary - mammary - inframammary
- 2-Mid axillary : upper, middle, lower zones
- 3-Mid scapular : supra, inter, infrascapular

b-Comment on : breath sounds - vocal resonance - added sounds - special tests

I-BREATH SOUNDS

1-Normal vesicular sound: "alveolar breathing"

-Mechanism : flow of air in and out the normal lung alveoli

-Character :

1-rustling (vesicular)

2-inspiration is 3 times longer than expiration

3-no gap between inspiration & expiration



2-Abnormal vesicular sounds :

a-Diminished vesicular breathing :

-Definition : vesicular breathing with diminished amplitude (diminished air entry)

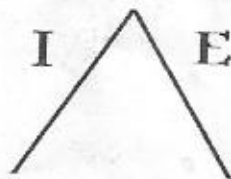
-Normal : in elderly & obese, thick chest wall.

-Causes : -pleural diseases : effusion, pneumothorax

-lung diseases : late emphysema (silent chest), fibrosis, collapse
COPD → late

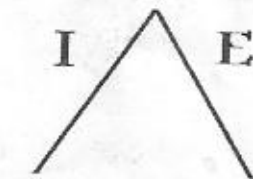
-Definition : exaggerated "louder" vesicular

-Occur in : children "puerile breathing" - thin persons & after exercise



c-Vesicular with prolonged expiration :

occur in obstructive airway disease (COPD & Br. asthma)
due to narrow bronchioles



3-Bronchial breathing :

a-Characters :

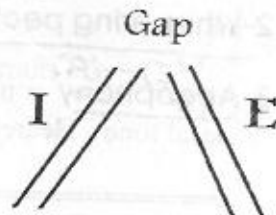
-expiration is prolonged & louder = Hollow = blowing -

-there is gap between inspiration & expiration

-Expiration > inspiration

b-Mechanism :

there must be 2 conditions ⇒ alveoli out of work + patent bronchi



c-Normally heard over :

trachea - above T4 in back - apex of right lung - occiput

⊗ Avoid auscultation within 2-3 cm of the midline ⇒ normal bronchial sounds

d-Abnormally heard over :

- consolidation
- cavity if : big, superficial & surrounded by consolidation
- collapse, fibrosis if associated with patent bronchus - Upper border of pleural effusion (rare)

e-Confirmed by : $\uparrow$ vocal resonance (esp. whispering pectoriloquy)

f-Types of bronchial breathing $\Rightarrow$ according to pitch into 3 types :

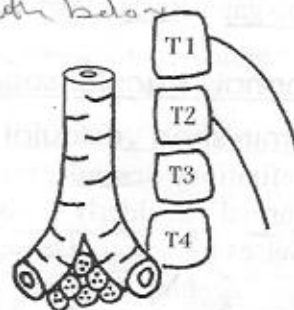
	1-Tubular	2-Cavernous	3-Amphoric
Definition	High pitch	Low pitch	Low pitch with superadded metallic tone
Model	Obstructed alveoli + patent bronchi	Empty cavity with relaxed walls connected to patent bronchus	Empty cavity with tense walls connected to patent bronchus
Causes	-Consolidation as pneumonia -Collapse + patent bronchus -Upper border of Pl. effusion	-Lung abscess -TB cavity	-Big abscess or TB cavity -Tension pneumothorax -Bronchopleural fistula

D'espine sign :

- "Auscultation of bronchial breath below bifurcation of trachea"
- Bronchial breathing (with $\uparrow$ vocal resonance)
 - Indicates enlarged mediastinal (interbronchial) LN e.g. : TB

Broncho-vesicular breathing :

- Bronchial in one phase of respiratory cycle "usually inspiration"
- vesicular in the other
- Occurs in : fibrosis - patchy consolidation or infiltration



II-VOCAL RESONANCE

Conducted voice sound - confirm bronchial breathing"

Tested while patient says 44 in Arabic - one one or nine nine in English - compare equivalent areas of chest

1-Bronchophony : normally spoken words are heard louder & clearer

2-Whispering pectoriloquy : whispered sound are heard border & clearer

(E) $\rightarrow$ (A)
3-Aegophony = nasal tone of bronchophony - normally spoken words are heard louder with nasal tone - Heard also over upper border of massive effusion

- Causes of $\uparrow$ vocal resonance : same causes of bronchial breathing
- Causes of $\downarrow$ vocal resonance : same causes of diminished breath sounds

consolidation
cavitation
collapse

III-ADDED SOUNDS "RALES"

* CREPITATIONS "Crackles - Opening Snap"

-Definition : moist interrupted wet sounds

"interrupted non musical additional sound"

-Mechanism :

1-Passage of air through fluid in bronchi & alveoli

2-Fluid or secretion accumulation in between rather than inside bronchi & alveoli

3-Recently : alteration in the elastic properties of lungs ($\downarrow$ compliance)

الهواء وهو داخل كاول يغير الـ Collapsed walls

-Relation to cough : persist - disappear due to expulsion of secretions

"Become less numerous or disappear after cough"

-Pitch : "only for medium & coarse" :

1-Consonating "metallic tone" e.g. consolidation

2-Non-consonating : indicates healthy pulmonary tissue "no break down"

-Types :

	1- Fine	2- Medium sized	3- Coarse
<u>Characters</u>	Frequent (6/cycle), faint, high pitch, late inspiratory	Between 1 & 3	Few (2 / cycle), loud, low pitched inspiratory & expiratory
<u>Mechanism</u>	Passage of air through <u>small</u> amount of fluid in alveoli or small bronchioles	Passage of air through <u>moderate</u> amount of fluid in alveoli or medium- size bronchi	Air bubbling through <u>big</u> amount of fluid in alveoli, <u>big</u> bronchi or <u>big</u> cavities
<u>Causes</u>	1-LV failure (bilateral & basal) 2-TB - pneumonia 3-Fibrosing alveolitis	1-Consolidation - cavitation 2-Bronchiectasis 3-Collapse & fibrosis	1-Acute pulmonary edema 2-TB (advanced) & pneumonia (resolving) 3-Bronchiectasis & lung abscess

B-RONCHI (WHEEZES)

-Definition : dry continuous musical sounds

-Mechanism : passage of air in a narrowed bronchus

-Causes :

-Outside pressure (LN)

-Wall lesion (tumor, fibrosis & bronchospasm)

-Lumen occlusion : secretions, F.B.

-Distribution : generalized (bronchitis, bronchial asthma) -localized (tumor, FB)

-Timing :

-Inspiratory due to secretions ($\downarrow$ by cough)

-Expiratory due to spasm or edema

-Relation to cough : persist -disappear

-Types :

	<i>Sibilant ronchi (wheezes)</i>	<i>Sonorous rhonchi</i>	<i>Polyphonic</i>
1-Pitch	high pitched	low pitched	both high & low pitch
2-Site	best heard over sides	best heard over midline	Sides & midline
3-Cause	narrowing of small bronchioles	narrowing of big bronchi	both
4-Example	bronchial asthma	chronic bronchitis , carcinoma	chronic bronchitis

C-PLEURAL RUB

-**Definition** : localized superficial leathery friction sound

-**Cause** : acute dry pleurisy

-**Auscultation** : localized, best heard at lower side of chest

-**Description** :

-Increased by firm pressure by stethoscope & by deep breathing

-Occurs during both inspiration & expiration, disappear by holding breath

-Unchanged by forceful cough.

IV-SPECIAL TESTS

	<i>1-Post - tussive suction</i>	<i>2-Succussion splash</i>	<i>3-Coin test</i>
Heard over	Collapsible cavity "lung abscess"	Hydropneumothorax	Pneumothorax & big emphysematous bullae
Technique of auscultation	auscultate after prolonged cough ,a suction sound is heard	while vigorously shaking patient a sound of turbulent fluid is heard at upper level of fluid	auscultate front while percussing by 2 coins from back. A metallic bell sound is heard

⌘ **Other special tests :**

1-Pneumothorax click :

-Tapping metallic sound synchronous with heart beat

-Occur in left sided pneumothorax esp. tension type

2-D'espine sign ⇒ see before

DIAGNOSIS OF CHEST DISEASES

a-Etiological :

- 1-Congenital : infected cystic lung
- 2-Traumatic : pneumothorax
- 3-Neoplastic : bronchial carcinoma or adenoma
- 4-Inflammatory or infectious : pneumonia, COPD, TB, lung abscess.
- 5-Others : -systemic diseases : SLE with pleurisy or interstitial fibrosis
 -blood diseases : hemophilia or purpura with hemoptysis
 -allergic : bronchial asthma

b-Anatomical :

- 1-Rt, Lt lung or bilateral
- 2-Front or back
- 3-Upper, middle, lower zones

c-Pathological : *see table* : consolidation , cavitation ...

d-Functional :

- 1-Compensation : compensated or non compensated (respiratory failure = central cyanosis)
- 2-Complication : cor pulmonale : RVE $\pm$ failure -tender pulsating liver -P. hypertension -TR

MISCELLANEOUS TOPICS

Bed Side Test To Assess Respiratory Function

1-**Forced expiratory time** : using stethoscope over trachea - Normally 3 -4 sec

2-**Match test** : trial to blow with open mouth a match at 15 cm distance

3-**Holding breath test** : normally 10-20 sec.

4-**Manifestation of respiratory failure** :

- drowsiness -central cyanosis
- flapping tremor -tachypnea > 40 / min

5-**Tape test for chest expansion** : N = 4 - 6 cm at nipple line
if < 2 cm there's generalized restriction of chest mobility as COPD

Bronchopulmonary Segments

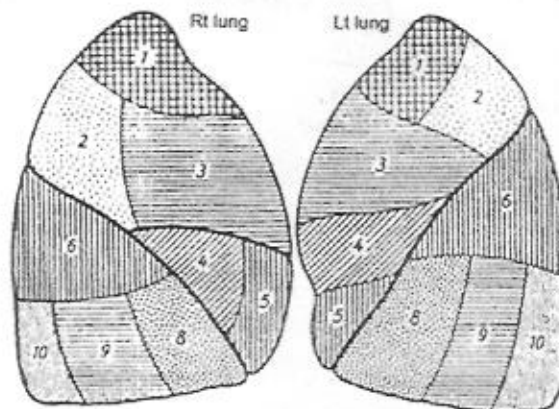
-**Definition** : each lung is subdivided into a functionally independent segments each is supplied by a tertiary bronchus called bronchopulmonary segment (BPS)

-**Shape & structure** :

- Each BPS is wedge shape, having an apex at hilum & a base at surface of lung
- Each is supplied by a branch from pulmonary a. & pulmonary v.

-**Pattern & number of BPS**

<i>Right lung</i>		<i>Left Lung</i>	
Upper Lobe	Middle Lobe	Upper Lobe	
1 Apical	4 Lateral	1 Apical	} considered single segment (apico posterior)
2 Posterior	5 Medial	2 Posterior	
3 Anterior		3 Anterior	
Lower Lobe		4 Superior	} Lingular
6 Superior		5 Inferior	
7 Medial basal (can't be seen from lat. view)		Lower Lobe	
8 Anterior basal		6 Superior	
9 Lateral basal		7 Medial basal	} (can't be seen from lat. view) considered single BP segment
10 Posterior basal		8 Anterior basal	
		9 Lateral basal	
		10 Posterior basal	

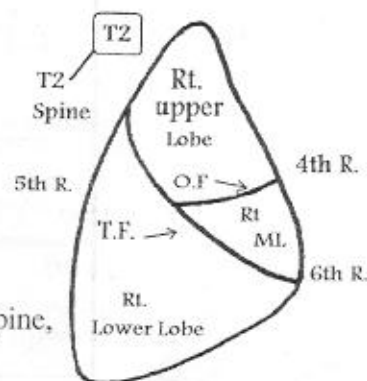


Surface Anatomy of Lung

- 1-Apex of lung :** curved line rising 2-4 cm above inner 1/3 of clavicle , passing downwards to sternoclavicular joint
- 2-Anterior border :**
 - From sternoclavicular joint, line pass downwards & medial to reach middle line at angle of Lewis .
 - It then descends in midline :
 - In Rt. lung it reaches level of 6th costochondral cartilage
 - In Lt. lung it reaches level of 4th costal cartilage & then deviate for 1 inch to Lt of sternum (bare area of heart - cardiac notch) , then it curve down & medially to end at 6th costochondral cartilage

3- Lower border :

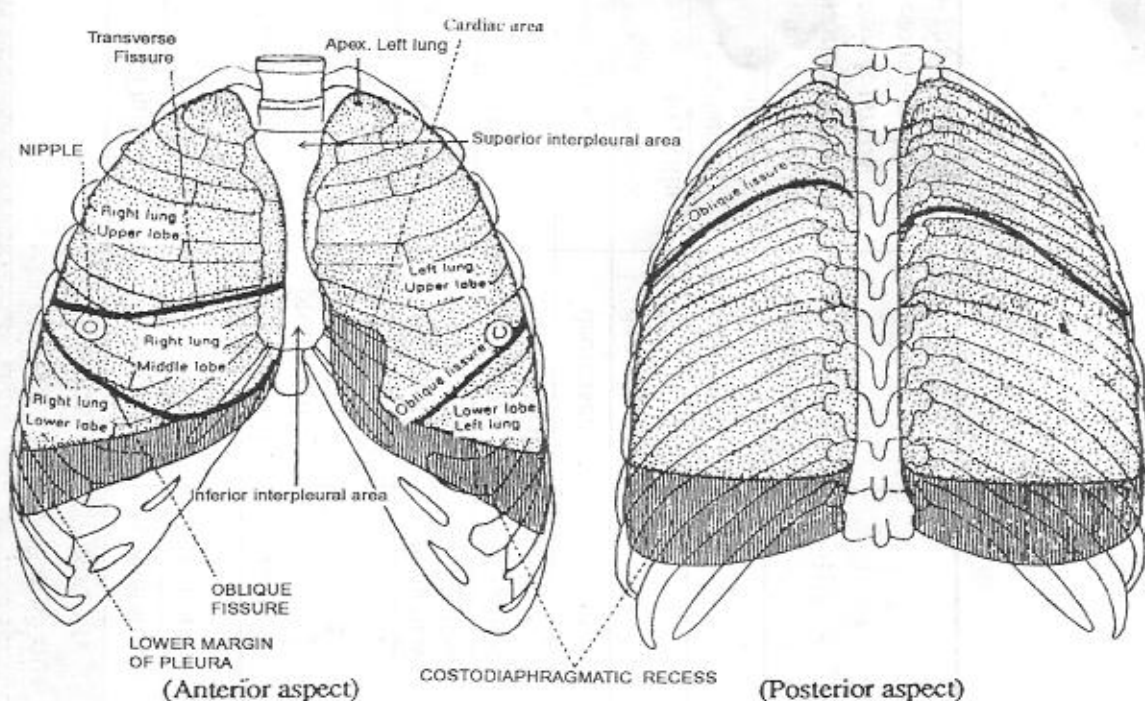
Lower border of	MCL	MAL	Scapular line
Lung	6th rib	8th rib	10th rib
Pleura	8th rib	10th rib	12th rib



- 4-Posterior border :** runs vertically upwards along sides of vertebral column starting from level of T10 spine below, ending at apex above
- 5-Oblique fissure :** line passing down & outwards oblique line from T2 spine, to the 5th rib in mid-axillary line, then to the 6th costo-chondral junction.

6-Transverse fissure of right lung :

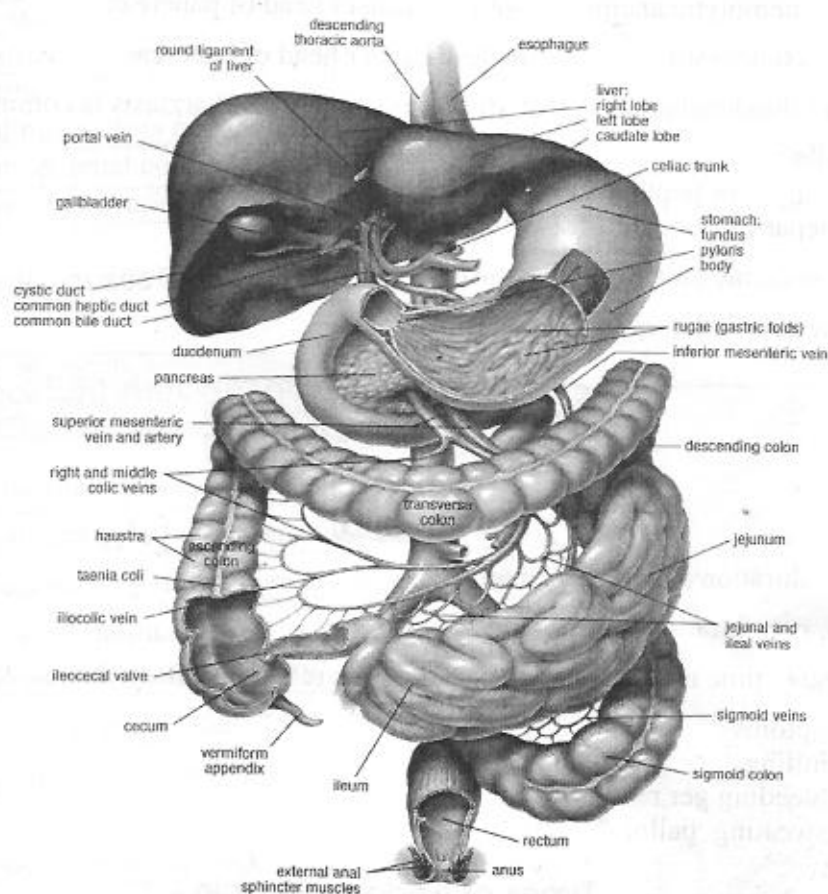
From 4th costochondral junction to meet the line of oblique fissure in MAL



Surface marking of pleurae, lungs and fissures

Chest disease	Inspection		Palpation		Percussion	Auscultation		
	Shape and form	Movement	Mediastinum	TVF		Breath sounds	Adventitious Sounds	Special tests
1-Consolidation	Normal	↓↓	Central	↑↑	Dull	Bronchial	Crepitations	-----
2-Cavitation	Normal	↓↓	Central	↑↑	Dull	Bronchial	Crepitations	Post tussive suction
3-Emphysema (+chronic bronchitis)	Barrel	↓↓	Central	↓↓	Hyper resonance encroaching on normal cardiac & hepatic dullness	-Vesicular with prolonged respiration - Late decrease	Ronchi	
4-Collapse	Retraction	↓↓	Shift to same side	↓↓	Dull	decreased ± bronchial	Ronchi & crepitations	
5-Fibrosis	Retraction	↓↓	Shift to same side	↓↓	Dull	decreased ± bronchial	Ronchi & crepitations	
6-Pleurisy	Normal	↓↓	Central	Normal	Normal	decreased	rub	
7-Pleural effusion	Bulge	↓↓	Shift to opposite side	↓↓	Stony dullness rising to axilla	decreased		
8-Pneumo thorax	Bulge	↓↓	Shift to opposite side	↓↓	Tympanitic resonance	decreased		+ ve coin test
9-Hydropneumo thorax	Bulge	↓↓	Shift to opposite side	↓↓	Stony dullness with horizontal upper limit & tympanitic resonance above it + shifting dullness	decreased		Succussion splash

ABDOMEN



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Spleen	93
Kidneys	94
Colon, urinary bladder	95
LN, Abdominal aorta	95
Tender points of abdomen	96
Percussion	97
Auscultation	98
Rectal examination - PR	100
Diagnosis of abd. diseases	100

HISTORY

PERSONAL HISTORY

- 1-Age : young : hemolytic anemia -old : cancer head of pancreas
 2-Sex : females : cholecystitis -males : cancer head of pancreas
 3-Occupation : duodenal ulcer in stressful occupation - Bilharziasis is commoner in farmer
 4-Special habits :
 -cigarette smoking : for peptic ulcer
 -alcohol : for hepatitis
 5-Residence : endemic area for Bilharziasis & parasitic infestation
 6-Marriage : sterility in liver cirrhosis & Bilharziasis

PRESENT HISTORY

1-Pain

- Onset, course, duration, character, intensity
- Site, radiation, precipitating & relieving factors
- Relation to meals : time relation (peptic ulcer) -type relation (biliary disease & IBS)
- Associated symptoms :
 - nausea & vomiting
 - tenesmus & bleeding per rectum
 - autonomic : sweating, pallor & vomiting

Types of Abdominal pain

Visceral	Somatic	Referred
Vague, non localized -Colic : from hollow organs (obstruction) -Dull ache : from hollow or solid organ (distention)	Sharp, localized (parietal peritoneum)	-Vague, non localized -Pain is felt at a site other than that stimulated but in an area supplied by the same (or adjacent) neuron

Causes of abdominal pain :

- 1-Pain originating in abdomen :
 -Parietal peritoneum inflammation
 -Distension of hollow viscera : intestinal, biliary or ureteric
 -Distention of capsule : hepatic, splenic or renal
 -Vascular : embolism or thrombosis - ischemic colitis - dissecting abdominal aortic aneurysm
 -Mechanical : muscle trauma & traction of mesentery
- 2-Pain referred from extra abdominal sources :
 -chest : pneumonia & myocardial infarction
 -spine : radiculitis from arthritis
 -genitalia : torsion testis

- 3-Metabolic : uremia, ketoacidosis, hemolytic crisis, porphyria
- 4-Toxic : poisoning
- 5-Neurogenic : organic (tabes dorsalis & HZ) -functional

Causes of acute abdominal pain :

1-Abdominal causes :

- 1-Acute appendicitis
- 2-Acute cholecystitis
- 3-Acute pancreatitis
- 4-Acute intestinal obstruction or food poisoning
- 5-Intestinal, biliary & renal colic
- 6-Salpingitis or twisted ovarian cyst

2-Non abdominal causes : same as causes of referred pain

Important sites of abdominal pain

- Esophagus : substernal + back, neck, jaw & arm
- Stomach : epigastrium + left upper quadrant & back
- Duodenum : epigastrium + right upper quadrant & back
- Small intestine : periumbilical
- Colon : below umbilicus on the side of lesion
- Rectosigmoid : suprapubic region
- Rectum : posteriorly over the sacrum
- Pancreas : epigastrium
 - Head : R. hypochondrium & back + belt around abdomen
 - Tail : L. hypochondrium & back + belt around abdomen
- Hepatic pain : R. hypochondrium - dull aching pain
- Splenic pain : LUQ
 - 1-Dull ache : stretch of capsule
 - 2-Dragging : stretch of ligaments by weight of enlarged spleen
 - 3-Stabbing : sharp localizing pain with perisplenitis
- Gall bladder pain :
 - 1-Dull ache (inflammation) colic (obstruction)
 - 2-In epigastrium or RUQ radiating to Rt shoulder (scapular region - C4, phrenic)
 - 3-It may radiate to Lt shoulder in bilateral GB innervation.

2-Swelling

- Swelling : may be one of ③ = organomegaly (huge spleen) - abdominal mass - ascites
- Comment on :
 - Onset, course, duration, site
 - history of trauma
 - painful or not

3-GIT Symptoms

A-Upper GIT Symptoms

1-Change of appetite :

a-Anorexia : loss of appetite - causes are :

- Psychogenic : anorexia nervosa & depression
- GIT : atrophic gastritis , cancer, viral hepatitis
- Debilitating diseases : TB, liver F., renal F., malignancy

b-Polyphagia : increased appetite - causes of polyphagia + weight loss :

- DM - thyrotoxicosis - steatorrhea - parasitic infestations

c-Parorexia : perverted appetite = desire for unusual food - causes are :

- Ankylostoma - pregnancy - Ca deficiency - psychogenic

d-Acoria : absent sense of satiety after meal $\Rightarrow$ in neurasthenia - brain tumors - § of CNS

e-Bulemia : "Diana disease" = episodic ingestion of large amount of food followed by induced vomiting

2-Halitosis : bad odour of mouth - causes are :

a-GIT :

- Oral cavity : bad oral hygiene, food (onion), dental caries, pyorrhea, tonsillitis, sinusitis, xerostomia (dry mouth in Sjogren's syndrome)
- Esophagus : diverticulum & cancer
- Intestine : malabsorption, chronic intestinal obstruction

b-Liver cell failure "feto hepaticus"

c-Lung : SLS

d-Renal : ch. renal failure "ammoniacal odour"

3-Salivation disturbances :

a-Ptyalism = increased salivation :

- True $\Rightarrow$ inflammation & tumors of tongue, gums
- False $\Rightarrow$ facial palsy

b-Xerostomia "aptyalism" = dry mouth in $\Rightarrow$ mouth breathers - Sjogren's syndrome - dehydration - uremia - DM - depression - atropine

4-Eructation - belching :

- retropulsion of air either from esophagus or from stomach

-causes : same causes of distention especially gastric disease (functional & organic)

5-Hiccough :

- abnormal spasmodic contraction of diaphragm due to irritation of phrenic N. or diaphragm

-causes are :

a-Renal failure "uremia"

b-Neck : rapidly enlarging thyroid

c-Chest : pericarditis, empyema & mediastinal syndrome

d-Diaphragm irritation : subphrenic, liver or splenic abscess - acute gastric dilatation

e-Idiopathic : simple type - treated by rebreathing in a plastic bag to $\uparrow$ CO₂ & stimulate RC

6-Waterbrush :

- sudden regurgitation of tasteless colorless fluid to mouth (due to sudden regurgitation of saliva collected in esophagus)
- causes : as heart burn

7-Heart burn : pyrosis - cardialgia

- Vague retrosternal burning sensation due to acid regurgitation from stomach
- Aggravated by recumbence & leaning forward & relieved by antacids
- Causes :
 - functional : stress
 - organic : reflux oesophagitis - hiatus hernia - duodenal ulcer

8-Nausea :

- disagreeable sense in epigastrium accompanied by desire to vomit

9-Vomiting :

- Definition : forceful expulsion of gastric contents into mouth due to passive relaxation of stomach wall & spasmodic contraction of diaphragm & abdominal ms while pylorus is closed & cardia is opened

-Ask about :

- a-Spontaneous or induced - induction of vomiting in :
 - bulimia nervosa - to relieve pain of peptic ulcer - to abort an attack of migraine

b-Preceded by nausea or not**c-Projectile or effortless****d-Time :**

- early morning : central
- during meals : esophageal obstruction
- 1/2 hr. after meals $\Rightarrow$ gastric ulcer -2-3 hr. after meals $\Rightarrow$ duodenal ulcer
- late (> 8 hr.) : pyloric obstruction
- Odour : foul (pyloric obstruction & cancer stomach) -fecal (intestinal & gastrocolic fistula)

e-Contents :

- mucus : chr. gastritis & malignancy
- bile : regurgitation of duodenal contents
- fecal matter : intestinal obstruction
- parasites : ascaris
- blood : peptic ulcer & cancer stomach
- stone : cholecystogastric or duodenal fistula

☞ **Retching** : as vomiting, but without relaxation of cardia, thus nothing is expelled to mouth

10-Hematemesis : vomiting of blood - ask about :

- a-No. of attacks, amount & other contents
- b-Precipitating factors : e.g. drugs
- c-Colour : dark brown (acid hematin) : gastric in origin - bright red : esophageal in origin
- d-Associated symptoms : melena, confusion, epistaxis
- e-ttt : blood transfusion

☞ *Common causes of hematemesis in Egypt : esophageal varices -peptic ulcer -drug erosion*

11-Dysphagia : difficulty in swallowing - ask about :

- Onset - course - duration
- To fluids (achalasia) or to solids (organic obstruction)
- Painful dysphagia = odynophagia $\Rightarrow$ corrosives, achalasia, cancer esophagus

12-Dyspepsia "indigestion" :

- Definition : any discomfort related to meals
- Manifestations : abd. pain, heart burn, nausea, flatulence, constipation or diarrhea
- Time :
 - during meal : esophageal obstruction
 - 1/2 hr. after meal in GU -2-3 hr. after meal in DU -late (< 8 hr.) in pyloric obstruction
- Pptg food : fats in chr. cholecystitis -meat in cancer stomach -starch in GU
- Periodicity : during spring & autumn in peptic ulcer

B-Lower GIT Symptoms**1-Flatulence "wind" & audible borborygmi** "*intestinal sounds*"

- Flatulence = sense of abdominal distention + borborygmi + frequent passage of flatus & eructation
- Causes : biliary, colonic dyspepsia, malabsorption syndrome

2-Change of bowel habits :**a-Constipation** : infrequent evacuation of bowel (> 48 hr.) + passage of hard small stools

- Obstipation = *absolute constipation*
- Stools : amount, consistency, colour
- Associated symptoms : alternation with diarrhea (in IBS) - spurious diarrhea (in cancer colon)

b-Diarrhea :

- Frequent bowel motions (> 4 / day), loose stools or both
- Frequency
- Stools : amount, consistency, colour, odour, blood or mucus

c-Tenesmus :

- Frequent painful desire to defecate + sense of incomplete bowel evacuation
- Causes : rectal lesion (inflammation or mass)

d-Dysentery : diarrhea + tenesmus + blood + mucus - *causes are* :

- 1-Infective : bacterial (bacillary) -protozoal (ameba, giardia, malaria) -metazoal (bilharzial)
- 2-Metabolic : uremic
- 3-Toxic : mercury poisoning
- 4-Local : diverticulosis, ulcerative colitis, cancer colon & rectum

3-Bleeding per rectum & melena :

-Bleeding PR : passage of fresh blood from below level of small intestine (ligament of Trietz)

Ask about : N^o of attacks & amount (massive or small) - associated symptoms

-Melena : passage of digested blood with stools due to bleeding from upper GIT (above ligament of Trietz)

-Character : black (tarry) glistening, soft & offensive

-DD : iron, charcoal or bismuth

4-Passage of worms : e.g. ascaris & enterobius

5-Colour of stools : black (melena) -Pale (clay stools in obstructive jaundice)

4-Hepato-Biliary Symptoms

“Jaundice”

1-Onset : acute : viral hepatitis & calcular obstructive j. -gradual : liver c. & malignant obstructive j.

2-Course : progressive : malignancy - regressive : hepatitis - intermittent : chr. hepatitis & calcular obstruction

3-Duration : short : V. hepatitis > 2 ws -long : cirrhosis & malignancy (if > 2 y. exclude cancer)

4-Urine : dark : in obstructive J & hepatocellular -normal : in hemolytic J.

5-Stool : pale in obstructive - deeply coloured in hemolytic

6-Anorexia, nausea & vomiting : occur at onset of V.H.

7-Fever :

-In viral hepatitis (preicteric phase)

-Hemolytic crisis : with bony pains, dark urine

-Charcot's triade in obstructive J. : fever & rigors + Jaundice + biliary colic

8-Pain :

-Biliary colic : in obstructive J. (referred to epigastrium, back, shoulder, associated with severe vomiting)

-Dull pain in Rt hypochondrium & epigastrium : in I.H., obstructive J, hemolytic crisis

-Epigastric pain radiating to back : cancer head

-Bony pains : hemolytic crisis

9-Pruritis : in obstructive jaundice

5-Uro-Genital Symptoms

1-Pain :

- Renal : dull ache in loin referred to hypochondrium
- Ureteric : colicky from loin to groin
- Bladder : suprapubic referred to tip of penis
- Prostatic : bladder pain + perineal pain
- Urethral : burning (scalding) pain during micturation

2-Micturation disturbances :

- Dysuria : pain experienced prior to, during or after micturation (gonorrhea)
- Strangury : in addition to dysuria there is intense desire to urinate every few minutes without relief of pain = *vesical tenesmus* (endoxan ttt)
- Frequency : ↑ frequency of micturation in cystitis, DM, prostatic enlargement (urine volume may be constant)
- Urgency : strong desire to micturation (cystitis) - Incontinence occur if no opportunity to urination
- Precipitancy : severe urgency. Patient can not hold his urine (UMNL)
- Hesitancy : difficult to start micturation (prostate)
- Second micturation : in large bladder diverticulae
- Retention : acute or chronic
- Difficult to maintain act : ↓ by straining : urethral stricture - ↑ by straining : prostate
- Stream abnormalities : continuous or interrupted, thick or thin, strong or weak, biforked or 1 stream
- Enuresis : involuntary voiding of urine during sleep

3-Urine abnormalities :

a-Volume abnormalities :

- Polyuria : volume of urine > 1500 CC / 24h.
- Oliguria : volume of urine < 400 CC / 24h.
- Anuria : complete absence of urine > 12 - 24 hours

b-Colour abnormalities :

- Red : hematuria, hemoglobinuria, food (beet root) & drugs (Rifampicin)
 - Dark (tea-like) : obstructive & hepatocellular jaundice
 - Milky or cloudy : pyuria, phosphaturia, chyluria, proteinuria (precipitate on heating)
- ∞ Bence Jones proteins (in multiple myeloma) : precipitate at 55 °C & disappear at 80 °C

c-Abnormal contents :

- Blood (hematuria) : 3 glass test : initial : urethral -terminal : bladder* -total : renal
- Shreds of tissues (necroturia) : in bladder cancer
- Stones : N^o, size, colour & shape
- Gas (pneumaturia) : in vesicocolic fistula
- Urethral discharge

4-Uremic symptoms :

- a-High urea : -GIT : anorexia + altered food taste + bad mouth odour - N & V. - hiccough
- CNS : lack of conc., drowsiness, headache, insomnia
- b-Dehydration : thirst, dry coated tongue & dry inelastic skin

5-Sexual disorders :

- Libido (desire) : increased or decreased
- Erection : potent or impotent
- Coitus : painful coitus (dysparunia)
- Ejaculation : premature, painful or retarded
- Infertility : 1ry or 2ry sterility
- Breast : atrophy in female, gynecomastia in males

6-Constitutional Symptoms

1-In Liver C. , malignancy & TB peritonitis : ask about

Fever - sweating - loss of appetite - loss of weight -weakness & fatigue

2-In splenomegaly : ask about

- a-Bone pains : leukemia
- b-LN all over body
- c-Bleeding tendencies in skin : petichae (minute) , purpura (moderate) & ecchymosis (large)
- d-Bleeding tendencies from orifices :
 - epistaxis, hemoptysis, hematemesis
 - bleeding PR & melena, hematuria, menorrhagia

7-Swelling of LL "Edema"

-In liver cell failure & B. cor-pulmonale

-Ask about :

- Onset - course -duration
- Site of appearance, extent, uni-or bilateral
- Pitting or non pitting (myxoedema, lymphedema)
- Tenderness (inflammation)
- Relation to ascites : ascites precox in TR, pericardial effusion

8-Female History

menstrual history , obstetric history

9 -Other Systems

- Heart : cor pulmonale
- CNS : pellagra, SCD, hepatic coma
- Chest : TB

PAST HISTORY

1-Diseases :

- Intestinal parasites : ameba , Bilharziasis
- Common disease : DM, TB & hypertension
- Viral hepatitis : blood transfusion, infection
- Fever : typhoid & brucellosis

2-Operations & blood transfusion : hepatitis esp. HCV

3-Drugs ⇒ hepatotoxic drugs :

- a-Dose dependent : paracetamol
- b-Dose independent :
 - acute hepatic necrosis : INH & PAS
 - chr. active hepatitis : aldomet
 - cholestatic hepatitis : chlorpromazine
 - pure cholestasis : Rifampicine , synthetic androgens

FAMILY HISTORY

- 1-Similar condition in the family : familial polyposis, hemolytic anemia
- 2-Consanguinity
- 3-Common disease : TB, DM & hypertension

GENERAL EXAMINATION

1-MANIFESTATIONS OF LIVER CELL FAILURE :

1-Vital Signs :

- Temperature : low grade fever
- Pulse : water hammer pulse - bradycardia in obstructive jaundice
- BP : ↓ diastolic pressure (VD)
- RR : irregular in hepatic coma

2-General observation :

- Mentality : disturbed in hepatic encephalopathy
- Body built : -stunted growth in chronic liver disease since childhood
-wasting "spider man"
- Decubitus : orthopnea in tense ascites

3-Skin :

a-Spider naevi :

- Definition : dilated central arteriole with radiating capillaries
- Character : spider in shape, pulsating & variable in size (from pin head to 0.5 cm diameter)
- Site : areas drained by SVC (face, neck, UL & chest)
- DD : hereditary telangiectasia - venous star - Campbell de Morgan's spots (senile angiomas)

b-Palmar erythema : erythema opposite heads of metacarpals, thenar & hypothenar with central pallor (other causes : Rh. arthritis - ACTH ttt - pregnancy - some normal people)

c-Others : bleeding - pallor "anemia" - scratch marks - Dupuytren's contracture - pigmentation

4-Face "appearance" : emaciation

5-Eye :

- Puffy eye lids : edema
- Jaundice : lemon yellow (hemolytic J.) -olive green (obstructive) -orange-yellow (hepatocellular)
- Xanthoma & xanthelasma : hypercholesterolemia

6-Endemic parotitis : bilateral, painless

7-Mouth :

- Central cyanosis : opening of AV shunts + elevation of diaphragm by ascites
- Foetor hepaticus

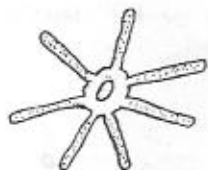
8-Neck veins : congested neck veins (cor-pulmonale & massive ascites)

9-Upper Limbs :

- Flapping tremors (asterixis)
- Nails : -koilonychia (in iron def. anemia)
-leukonychia (white opaque in hypoalbuminemia)
-clubbing in Bilharzial polyposis

10-Lower Limbs : edema

Skin manifestation of liver cell failure



Palmar erythema
spider naevi, paper money skin



Xanthoma
& Xanthelasma



Dupuytren's cord
Dupuytren's contracture

II-MANIFESTATIONS OF VITAMIN DEFICIENCIES :

- Vitamin A** : -follicular hyperkeratosis
-eye manifestation : xerophthalmia , keratomalacia, night blindness
- Vitamin B1** : Beri - Beri
- Vitamin B2** : Ariboflavinosis
 - Angular stomatitis - Cheilosis
 - Re glazed tongue
 - Pytriasis alba
 - Circumcorneal vascularization
- Vitamin B6** : dermatitis & peripheral neuritis
- Nicotinic acid** : pellagra
 - Pellagic rash : on sun exposed & pressure areas
 - Red glazed tongue
- Folic acid** : megaloblastic anemia
- Vitamin B12** : -megaloblastic anemia
 - GIT : glossitis , dyspepsia , diarrhea
 - CNS : subacute combined degeneration of spinal cord (SCD)
- Vitamin C** : scurvy (bleeding gums)
- Vitamin D** : Rickets or osteomalacia (bone pain & pathological fracture)
- Vitamin K** : hypoprothrombinemia (bleeding)



Angular stomatitis - Cheilosis

LOCAL EXAMINATION

COMPARTMENTS OF ABDOMEN

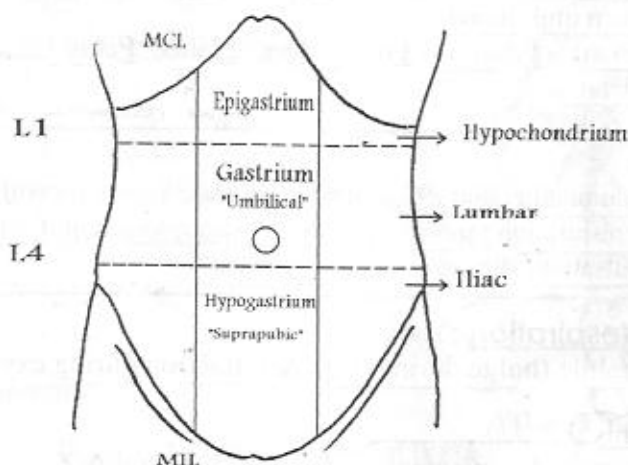
For purpose of description, the abdomen is divided by two descriptive systems into :

9 areas by :

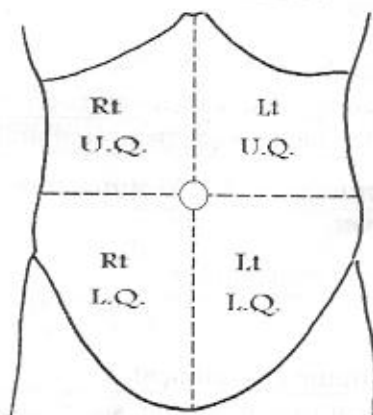
-2 horizontal lines :

- Upper one = subcostal plane or transpyloric plane (L1)
- Lower one = intertubercular plane or intercrestal plane (L4)

-2 vertical lines : midclavicular line = mid inguinal line (mid way between S. pubis & ASIS)



4 areas by : vertical & horizontal line crossing umbilicus



GENERAL RULES OF LOCAL EXAMINATION

-Good lightening

-Supine position : with pt. arms at his sides

-Full abdominal exposure : from nipples down to knees

-Abdominal examination includes examination of :

- Male external genitalia - back - PR
- Heart : for cor pulmonale
- CNS : pellagra - SCD - hepatic coma
- Chest : for TB

INSPECTION

A-General Inspection

1-Contour of abdomen :

-**Normally** : preserved waist & slightly scaphoid

-**Retraction** (scaphoid) :

- starvation, dehydration,
- wasting disease (malignancy), TB



-**Bulge** or distention occur in **7 fs + M** :

- Fluid** (ascites - bulging more in flanks - in other bulge is anteroposterior)
 - Fat** (obesity = sunken umbilicus)
 - Fluid in a cyst** (ovarian) - **Fibroma** - **Full bladder** - **Flatus** - **Fetus** → *sign of pregnancy*
 - Masses** - Liver - spleen ...
- ↓
Hyper resonance all over abdomen

-**Visible masses** :

- Intra** or extra abdominal : contraction of wall decrease size of mass if intraabdominal
- Movement with respiration** : moves up & down with respiration if related to diaphragm
- Comment on** : pulsation, site, size, shape & surface

2-Movements with respiration :

-**Normally** : freely mobile (bulge during insp. & retraction during exp.)

-**Disturbed movements** :

- Tense ascites** : decreased movements
- Peritonitis** : rigidity & absent movement
- Diaphragmatic paralysis** : unilateral : 1 side moves only - bilateral : paradoxical movement

3-Visible peristalsis :

a-Occasional finding in thin individuals

- in pyloric obstruction : slow waves in upper abdomen - moves from left to right
- in small intestinal obstruction : step ladder pattern around umbilicus

b-**Stimulated by** : -gentle tapping, or massage - cold stimulation of skin (2 drops of ether)
-drinking soda water

c-Confirmed by succussion splash "in auscultation"

4-Skin :

a-**Scars** : of cautery, operation or trauma - comment on :

- Type of scar : left paramedian scar in exploration, splenectomy, gastrectomy
- Healing : 1ry - 2ry intention - complications (keloid or sinus)
- Impulses on cough (incisional hernia)
- Pigmentation

⊗ **Significance of cautery scar** : indicates severe chr. pain + localizes site of maximum pain

b-**Striae** : due to rapid stretching of abdominal wall with rupture of elastic fibers -Types are :

- siae alba in obesity, pregnancy (gravidarum) & ascites
- siae rubra in Cushing & steroid ttt
- Striae nigrae SC injection of Heparin, insulin

c-**Scratch marks** : in LCF, obstructive J.

d-**Hemorrhage** : petichae, purpura in hypersplenism - ecchymosis in LCF

B-Specific Inspection

"From above downwards"

1-Breasts :

a-Gynecomastia :

- Definition : hypertrophy of glandular tissues of male breast with prominent nipples - usually bilateral & tender
- Causes of gynecomastia in liver C. : LCF ($\uparrow$ estrogen) - drugs (spironolactone, digoxin)

b-Atrophy of female breasts : LCF

2-Subcostal angle :

- Normally : acute to right angle ($70^\circ - 90^\circ$)
- Obtuse angle : chronic $\uparrow$ intraabdominal pressure (upper swelling & ascites)

3-Epigastric pulsation : causes are :

- a-Aortic : transmitted normally (thin individual), AR, aneurysm
- b-Right ventricle : RVE in B cor-pulmonale
- c-Hepatic : TR, TS, pericardial disease & hemangioma

4-Divarcation of recti :

- Ask patient to sit unsupported
- Stretching & widening of linea alba in $\uparrow$ intraabdominal pressure

5-Umbilicus :

a-Site :

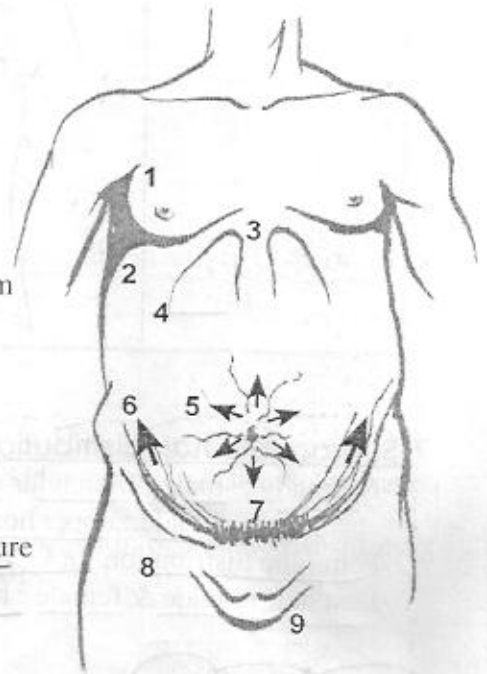
- normally : nearly midway bet. xiphisternum & symphysis pubis
- pushed downwards : gastric, hepatic & splenic masses
- pushed upwards : pelvi-abdominal masses

b-Shape : normally = inverted - everted = $\uparrow$ intraabdominal P.

c-Hernia : expansile impulses on cough

d-Skin :

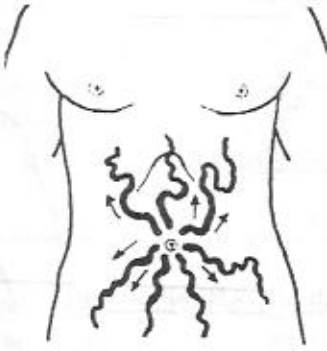
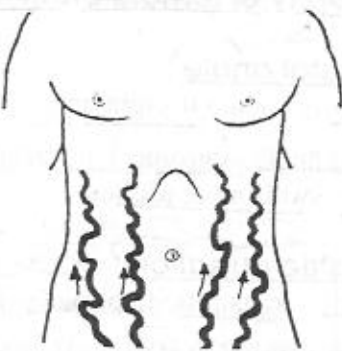
- Pigmentation :
 - Addison's disease - TB peritonitis
 - Meckle's diverticulum (reddish swelling)
 - Pancreatitis & intraperitoneal hemorrhage (Cullen's sign - bluish colour)
- Nodules : endometriosis, infiltration in abd.cancer, TB peritonitis
- Discharge :
 - pus : in inflammation - urine : in patent urachus
 - stools : in patent omphalo-mesenteric duct & intestinal fistula
- Ulceration - scar



6-Dilated veins : dd visible veins (not tortuous)

milking test

-How to DD portal hypertension from IVC obstruction ?

	Portal hypertension Caput medusae	IVC obstruction
1-Site of veins	-Prominent around umbilicus -Absent over the back	-Prominent in the flanks -Present in the back
2-Direction of blood flow (below umbilicus)	Away from umbilicus	Toward umbilicus
		

7-Suprapubic hair distribution :

- Normally : -male : triangular with apex towards umbilicus
-female : upper horizontal line
- Feminine distribution in LCF
- Lost hair in male & female : hypogonadism

8-Hernial orifices :

- Hernia = expansile impulse on cough .It occur in weak abd wall + ↑ intrabdominal pressure
- Sites : inguinal or femoral, linea alba, umbilical or incisional (in old scars)

9-External genitalia : e.g. Bilharzial mass of cord**C-Inspection of Back****1-Back of patient :**

- Deformities : kyphosis, scoliosis, kyphoscoliosis
- Tenderness
- Scars, swelling, hair tuft (spina bifida) renal angle

2-Back of scrotum : TB sinus**3-Back of breast in females :** for monilial infection & masses**4-Back of knee :** Becker cyst

PALPATION

GENERAL RULES : ⑥

- 1-Relax superficial abdominal fascia & muscles (ask patient to flex LL)
- 2-Should be done with warm, gentle hands to avoid guarding of abdomen (nervous patients usually are unable to relax)
- DD acute peritonitis, rigidity (absent abd. movement & intestinal sound)
- 3-Distract patient attention with conversations
- 4-Start palpation away from area of complaint & examine it lastly
- 5-Patient's facial expression should be watched during examination

METHODS OF PALPATION :

1-Superficial palpation :

- Aim : -gain patient's confidence
- detect : tenderness, rigidity & superficial swelling
- Method : start in Lt iliac fossa & turn anticlock wise to end in epigastric area in an S or G shape manner

2-Deep palpation :

- Confirm data obtained by superficial palpation
- Localize abdominal organs (organomegaly) & masses

3-Bimanual palpation :

- Both hands are used to gain more information - Done in palpating kidneys, spleen & liver for pulsation

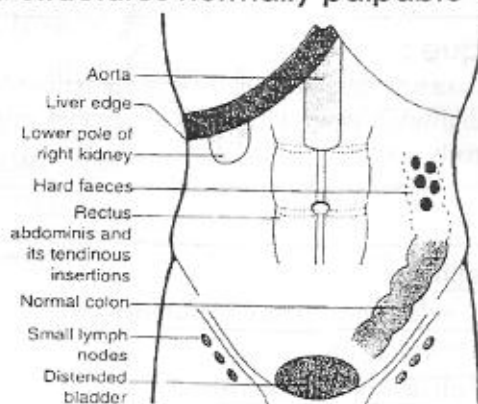
4-Dipping method : in tense ascites - Finger tips are suddenly pushed into abdomen, displacing fluid & causing the enlarged viscus to rebound against finger tips

5-Rolling method : in colon

Any abdominal swelling

- Intra or extra abdominal - how ?
- Movement with respiration : moves up & down if related to diaphragm
- Site -Size & shape -Surface -Skin over
- Structures under -Edge -Consistency -Tenderness -Pulsation

Structures normally palpable ⑥



1-LIVER

Surface anatomy :

-Site : Rt. hypochondrium & epigastric regions

-Upper border : a line connecting :

-Lt. MCL : 6th. rib

-Rt. MCL : 5th intercostal space

-Lateral border : 7th -11th rib in Rt.mid axillary line

-Lower border : a line connecting :

-Tip or Rt. 9th costal cartilage

-Midway between xiphisternum & umbilicus

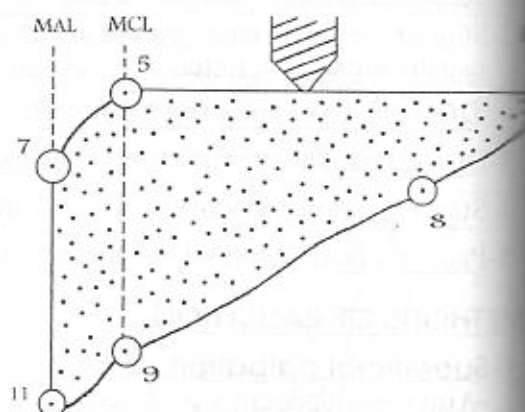
-Tip of Lt. 8th. costal cartilage

-6th rib in Lt. MCL

-Normal liver span : distance between upper & lower border of liver

-Rt. MCL : 10-16 cm

-Middle line : 4-8 cm



Techniques of liver palpation :

*Upper border : hepatic dullness detected by heavy percussion (tidal percussion)

*Lower border : detected by palpation & light percussion

1-Ordinary technique

2-Tips of hands : Hutchinson method

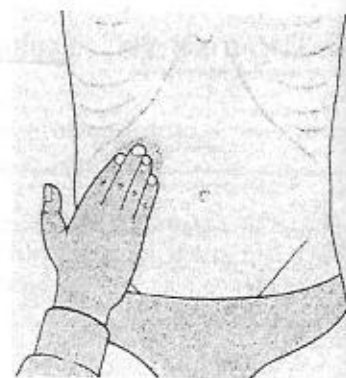
3-Hooking technique $\Rightarrow$ shrunk liver (patient supine)

4-Bimanual technique : to elicit hepatic pulsations

5-Dipping technique or ballotment in tense ascites

6-Auscultatory : Macleod method

7-Light percussion



In ordinary technique :

- Rt lobe from Rt iliac fossa upwards - normally it is not palpable except in thin people
- Left lobe : middle line, midway between umbilicus & xiphoid process, or a hand breadth below xiphoid, but normally not felt

Characters of hepatic swelling :

- 1-Intra-abdominal swelling in relation to Rt hypochondrium
- 2-Moving up and down with respiration
- 3-Rounded border (except if cirrhosis, it is sharp)
- 4-Dull on and continuous with liver dullness

2-GALL BLADDER

Surface anatomy : 2 methods

- 1- At intersection of lat. border of rectus abdominis with Rt. costal margin
- 2- Intersection of a line extending from Lt. ASIS to umbilicus with Rt costal margin.
(tip of 9th costal cartilage "Gray-Turner line")

Techniques of palpation : GB is palpated for swelling & tenderness - normally GB cannot be felt

- 1- As liver (ordinary method)
- 2- Murphy's sign = acute cholecystitis : ask patient to breath deeply, palpate for GB as usual -
Breath is arrested with a gasp as the mass is felt.

Causes of palpable GB :

- 1- Stone in cystic duct : mucocele (firm & regular) : no Jaundice
- 2- Carcinoma of GB (stony hard, irregular) : no Jaundice
- 3- Causes of obstruction of common bile duct as cancer head of pancreas : Jaundice

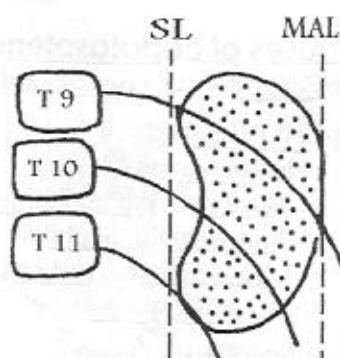
Characters of GB swelling :

- 1- Intraabdominal organ in Rt. hypochondrium
- 2- Moves with respiration (up & down) - mobile from side to side but not vertically
- 3- Pyriform or rounded in shape
- 4- Cystic in consistency - hard in malignancy
- 5- Inseparable from liver
- 6- Dull on percussion & continuous with liver dullness

3-SPLEEN

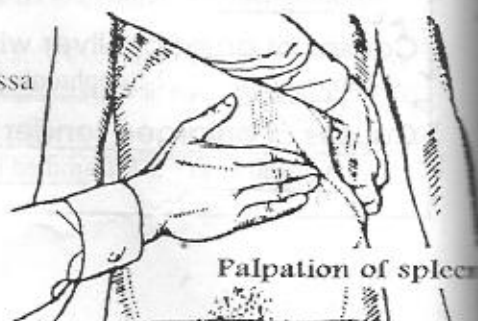
Surface anatomy :

- Site : Lt. hypochondrium
- Lies on the 9, 10 & 11th ribs posteriorly with its long axis in line with 10th rib
- Laterally : doesn't exceed mid-axillary line
- Medially : scapular line



Technique of palpation :

- 1- Bimanual :
one hand supporting left renal angle
and front hand should be firmly
placed over the left hypochondrium
 - a- In supine position from Rt. iliac fossa - from left iliac fossa
 - b- In Rt. lateral position (with flexed knees & hips)
- 2- Hooking method : standing on pt. left side
- 3- Dipping method in tense ascites
- 4- Percussion of Traube's area



Characters of enlarged spleen : DD of enlarged Lt kidney

Spleen	Left kidney
<i>Intra-abdominal swelling in left hypochondrium</i>	<i>Intra-abdominal swelling in lumbar region</i>
1-Move in early respiration - down & medially due to phrenicocolic ligament (may cross midline)	1-Move in late respiration - doesn't cross midline
2-Notched anterior border (pathognomonic)	2-Smooth rounded border
3-We can't insinuate hand between it & costal margin (you can't get above upper border)	3-We can insinuate your hand between it & costal margin
4-Does not fill and can't be pushed in renal angle anterior ballotment	4-Can be pushed in renal angle (fill renal angle) ballot freely anterior & posterior
5-Dullness on percussion is continuous with Traube's area dullness "no band of resonance"	5-On percussion , band of colonic resonance over swelling

Comment on :

- 1-Site
- 2-Size : normally not palpable below costal margin - if palpated : enlarged at least 2-3 times
- 3-Border : Bilharziasis has a sharp anterior edge with a notch
- 4-Surface : smooth in Bilharziasis
- 5-Consistency :
 - soft : in endocarditis, Malaria & septicemia
 - firm in Bilharziasis
- 6-Tenderness : in inflammation : typhoid & Brucellosis, TB (milliary) , SBE, infarction
- 7-Pitting sign = Mofti's sign : in chronic myeloid leukemia

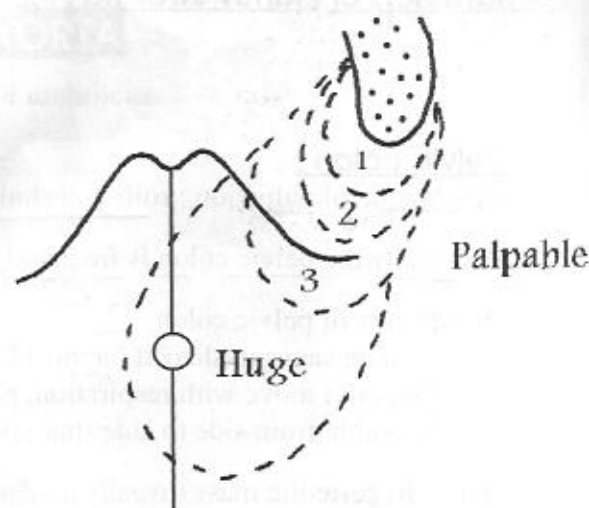
⌘ *Causes of absent splenic notch : adhesions - tumors - congenital - infarction*

⌘ Huge Splenomegaly

-Definition : spleen which crosses midline

-Causes :

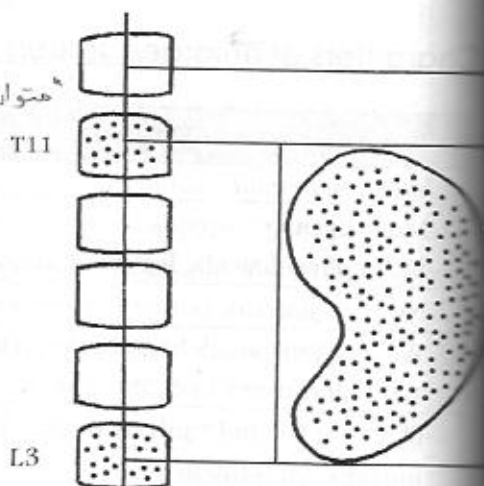
- 1-Bilharziasis
- 2-chr. myeloid leukemia
- 3-Thalassemia major
- 4-polycythemia rubra vera
- 5-Myelosclerosis
- 6-Malaria
- 7-Kala-azar
- 8-Lipoid storage disease
- 9-Splenic sarcoma



4-KIDNEYS

Surface anatomy :

- Rt. Kidney is 1 cm. lower than Lt. kidney
- Posteriorly : bounded by Morris's parallelogram :
 - 2 vertical lines : 3 & 9 cm from median plane
 - 2 horizontal lines : at level of spines of T11 & L3
- Anteriorly :
 - upper end : 11th space (Rt), 11th. rib (Lt)
 - lower end : 5 cm. above iliac crest (Rt)



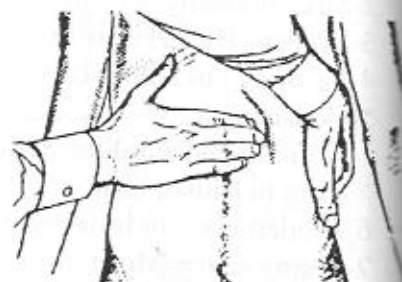
Techniques of palpation :

- 1-Bimanual
- 2-Ballotment technique (only if kidney is enlarged)

In bimanual method :

- 1-Left kidney : the Lt hand is placed anteriorly in the left lumbar region while the Rt hand is placed posteriorly in the left loin. The patient is asked to take deep breath while approximating both hand. Left kidney is normally not felt.
- 2-Rt kidney : as Lt kidney, but with opposite hands. Normally lower pole of Rt kidney is palpable in thin patient

- ✎ -**Renal angle** : angle between last rib and lateral border of sacrospinalis ms -Examine for tenderness, dullness & swelling
- Loin** : lies between last rib and iliac crest



PALPATION OF THE KIDNEY

Characters of kidney swelling : see before

5-COLON

A-Pelvic colon :

- Technique of palpation : rolling technique in left iliac fossa
- Normally the pelvic colon is frequently palpable in thin patient
- Characters of pelvic colon
 - 1-Oblong sausage-shaped (about 12 cm length)
 - 2-Does not move with respiration, parallel to the inguinal ligament
 - 3-Movable from side to side (but not vertically)
- DD -B. pericolic mass (usually tender), not friable or dentable by palpation
- Fecal mass usually dentable, friable in palpation

B-Coecum : normally coecum may be felt

- Technique of palpation : rolling technique in Rt iliac fossa
- Characters of coecum : soft, rounded swelling with indistinct borders

6-URINARY BLADDER

Characters of distended UB "retention of urine" - normally UB is not palpable

- 1-Has no lower border (pelvi-abdominal)
- 2-+ve fluid thrill
- 3-Oval in shape, smooth, firm, regular
- 4-Immobile, in suprapubic region, may reach to the umbilicus
- 5-Direct pressure on it produces a desire to micturate
- 6-Dull on percussion

7-PARA-AORTIC & MESENTERIC LN

Bimanual , Rolling technique

Para-aortic LN : umbilical & epigastric regions along lat. border of aorta

Mesenteric LN : at root of mesentery (the medial 2/3 of a line drawn from umbilicus to the Rt)

8-ABDOMINAL AORTA

Little above and to the left of umbilicus

Tender Points Of Abdomen

- 1-Mc Burney's point : appendicitis (is at junction of outer 1/3 & inner 2/3 of Rt spinoumbilical line)
- 2-Right iliac fossa : appendicitis, ureteritis
- 3-Left iliac fossa : spastic colitis, diverticulitis, ureteritis
- 4-Ovarian point : is 3 inches above pubic tubercle
- 5-Tubal point : is half an inch above midpoint inguinal ligament. Tenderness is bilateral.
- 6-Lower suprapubic region : cystitis
- 7-Umbilical region : enteritis
- 8-Upper umbilical region : transverse colitis
 - It is often associated with tenderness along ascending and descending colon
 - Its presence will help to differentiate cholecystitis from hepatic flexure syndrome
- 9-Right epigastrium : duodenal ulcer
- 10-Left epigastrium : gastric ulcer
- 11-G.B point : cholecystitis. (it is at the tip of Rt 9th costal cartilage & in Rt hypochondrium)
 - tenderness in Rt hypochondrium on deep inspiration. Murphy's sign = cholecystitis
- 12-Right hypochondrium : hepatic flexure syndrome (colitis)
 - Epigastrium and right hypochondrium over enlarged liver
 - Hepatitis : localized (lower right) intercostal tenderness is also present
- 13-Tip of left 9th costal cartilage : reflux esophagitis
- 14-Left hypochondrium : perisplenitis, splenic flexure syndrome (colitis)
- 15-Anterior pelvic point : at the junction of a horizontal umbilical line and a vertical line drawn from junction of inner 2/3 and outer 1/3 thirds of spino-umbilical line
- 16-Renal angle : tender kidney in pyelitis

PERCUSSION

Value :

- 1-Defining boundaries of abdominal organs & masses
- 2-Detection of ascites & its DD from ovarian cyst and intestinal obstruction
 - Use light percussion
 - Normally abd. is resonant (tympanitic) throughout except over liver
 - Obliteration of normal liver dullness occur in :
 - perforated peptic ulcer & perforated colon
 - subphrenic abscess with gas forming organisms

Defining borders of abdominal organs & masses :

- 1-Liver : -upper border of hepatic dullness = heavy percussion
 -lower border = light percussion
- 2-Spleen : to detect impalpable splenomegaly (< 3 times normal size) to confirm palpable spleen
 ⇒ dullness extends from left lower ribs into left hypochondrium & left lumbar region
- 3-Traub's area
- 4-Bladder : in 3 directions ⇒ superior and 2 lateral borders
- 5-Any palpable mass

Percussion For Ascites :

- 1-Transmitted fluid thrill : "large amount of ascites is present under tension"
 - Hand of patient in midline of abdomen should be firmly situated, to damp an impulse which may be transmitted through fat of abdominal wall
 - Flicker your finger on one side of abdomen & receive impulse with palm on opposite side
- 2-Shifting dullness < 1.5 liter ⇒ should be done in *both sides*
 - Gas containing intestine floats uppermost & ascitic fluid settles in flanks & pelvis
 - Percuss midline at umbilicus (below any organ)
 - Move your finger laterally till you meet flank dullness - Keep your finger in place while patient rolls on his side -Wait for seconds & percuss ⇒ dull note change to resonant
- 3-Knee-elbow position < 0.5 liter - percuss around umbilicus in this position
- 4-Sonar : since absence of shifting dullness or fluid thrill or both *does not* exclude ascites

The main value of abdominal percussion is to decide :

- Whether abdominal distention is due to : ascites - ovarian cyst - gas e.g. intestinal obstruction
- 1-In ascites : dullness in flanks, lower abdomen with a central resonance at & above umbilicus
 - 2-In ovarian cyst : resonant in flanks & mass can not be palpated from below
 - 3-In intestinal obstruction : resonant all through. abdomen + colicky pain + other symptoms

AUSCULTATION

1-Pulmonary area : for pulmonary hypertension (Billharzial cor-pulmonale)

2-Succussion splash : in distended viscous with gas & fluid - *causes are* :

- Pyloric obstruction & advanced intestinal obstruction
- Paralytic ileus : distention of loop

Place stethoscope on abdomen : with the free hand quickly depress abd. wall $\Rightarrow$ splash is heard.

3-Venous hum - Kenawy sign : systolic & diastolic "continuous"

-Site : between xiphisternum & umbilicus

-Causes :

- portal hypertension (porto-systemic anastomosis in lieno-renal ligament)
- vascular mass in liver

4-Auscultation for ascites "Puddle sign" :

Place stethoscope at umbilicus & move it laterally while tapping flanks by snapping index finger
A change of note is heard at edge of fluid

5-Intestinal sounds : heard on abdominal wall, just Rt to umbilicus

- Character : low pitched gargles of variable frequency (6-12 / min)
- Increased in : diarrhea & early intestinal obstruction
- Absent in : paralytic ileus & peritonitis
- Start abdominal examination by auscultation of intestinal sounds before palpation, because excessive maneuver in abdomen leads to irritation of intestine & $\uparrow$ rate of sounds

6-Arterial bruits : systolic murmurs heard due to :

- a-Renal artery stenosis
 - posterior : in renal angle
 - anterior (by cone) : deeply into ant abd. wall on either side of umbilicus (at level of abd. aorta)
- b-Superior mesenteric a. stenosis : in epigastrium
- c-Iliac a stenosis : corresponding iliac fossa
- d-Femoral a : groin
- e-Malignant tumors : e.g. hypernephroma, hepatoma

7-Scratch test : auscultatory method for hepatomegaly

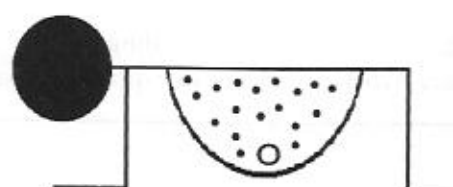
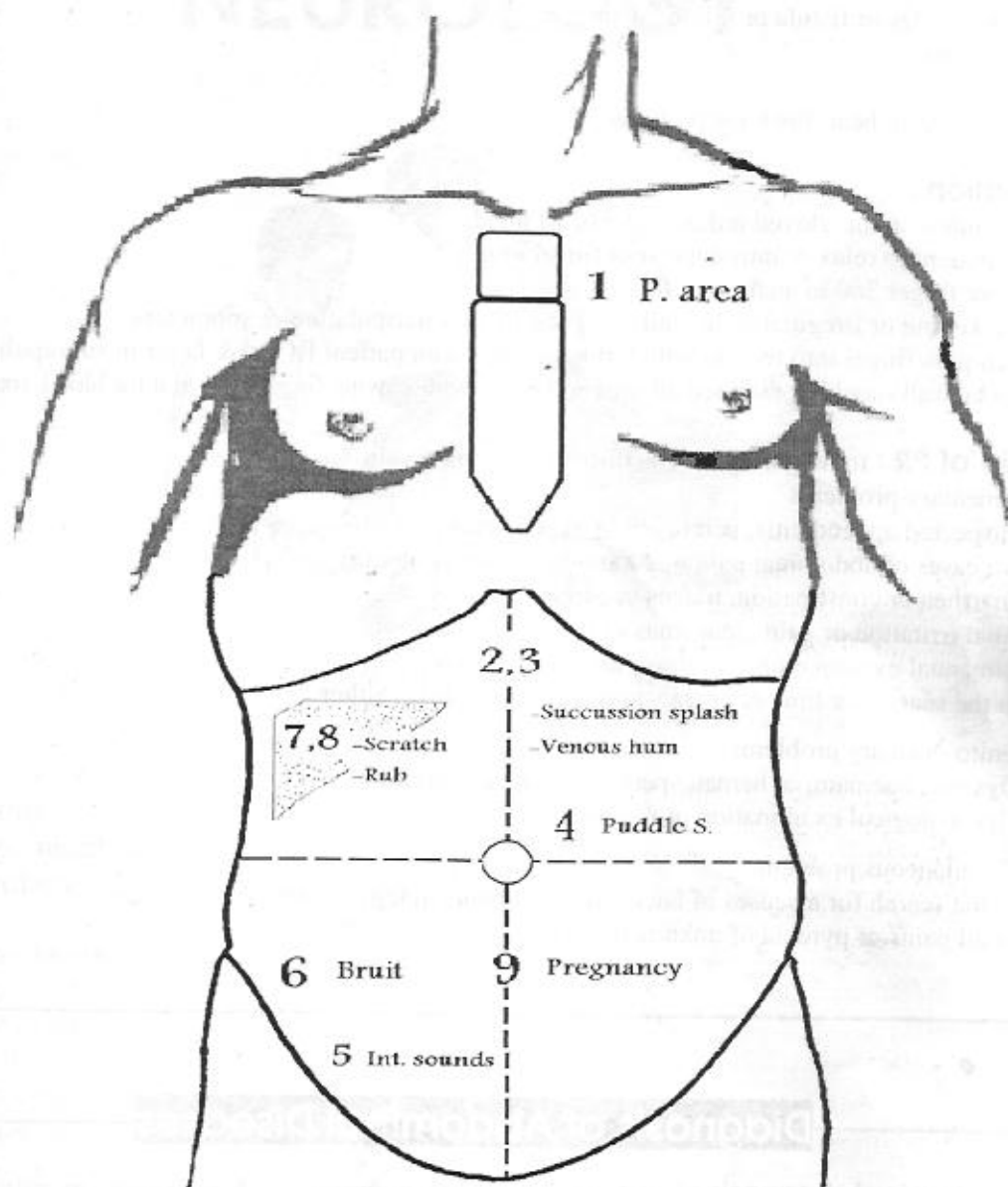
8-Friction rubs :

- a-Splenic rub : in Lt. hypochondrium - due to splenic infarction & perisplenitis
- b-Hepatic rub: in Rt. hypochondrium - due to hepatic tumor & perihepatitis

9-Pregnancy :

- a-Fetal heart sounds
- b-Uterine souffle

Value Of Abdominal Auscultation



Knee Elbow in ascites

a-Percussion

b-Puddle sign

Rectal Examination - PR

-Patient position : left lateral position (best) - Knee-elbow position (may be)

-Inspection : separate buttocks carefully inspect perianal area and anus for :

- 1-Pruritis ani (signs of inflammation)
- 2-External piles or fistula or pilonidal sinus
- 3-Anal warts
- 4-Anal fissure
- 5-Ask patient to bear down for prolapse

-Palpation :

- 1-Put a lubricant on gloved index finger of Rt hand
- 2-Ask patient to relax & introduce your finger gently
 - Rotate finger 360 in anal canal for :
 - Thickening or irregularity in wall
 - Tone of anal musculature & sphincters
 - Then pass finger into rectum with left hand placed on patient Rt hip & latter in suprapubic position
 - Rectal wall should be assessed all over 360
 - On withdrawing finger look at it for blood, mucous, pus

-Value of PR : to help in diagnosis of the following conditions :

- 1-Alimentary problems
 - Suspected appendicitis, pelvic abscess, peritonitis
 - All cases of abdominal pain in which the causes is obscure
 - Diarrhea or constipation, mucus or blood in stools
 - Anal irritation or pain , tenesmus or rectal pain
 - Bimanual examination of a lower abdominal mass
 - In the search for tumors or transperitoneal metastases either
- 2-Genito - urinary problems :
 - Dysuria; haematuria, hematospermia; epididymo-orchitis
 - Gynecological examination in virgins
- 3-Miscellaneous problems :
 - In the search for a causes of backache, root pains in legs or diffuse bone pains
 - In all pains of pyrexia of unknown origin

Diagnosis of Abdominal Diseases

1-Anatomical diagnosis : hepatomegaly - splenomegaly - hepatosplenomegaly

2-Etiological diagnosis : B. fibrosis (which stage ?) -Post-hepatic cirrhosis -Tumors

3-Functional diagnosis :

a-Compensation :

-compensated

-decompensated : cellular : LCF -vascular : bleeding varices

b-Complications : pulmonary hypertension + RVE -pericolic mass - kidney mass

NEUROLOGY



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HISTORY

A-Personal history :

- 1-Name
- 2-Age : young : myopathy - middle age : MS -old : stroke
- 3-Sex : C. pills contribute to $\Rightarrow$ DVT, headache, depression
- 4-Marital state : for sterility, impotence, still-births (as in S)
- 5-Occupation : printers for lead neuropathy
- 6-Residence : pellagra in rural areas
- 7-Special habits : alcoholic (P. neuritis), smoking (atherosclerosis)
- 8-Handedness :
 - in Rt handed people, the dominant hemisphere is left
 - only 25 % of Lt handed people have Rt. handed dominant hemisphere

B-Present history : ask patient about :

1-Symptoms of $\uparrow$ ICT : headache, vomiting, blurring of vision

2-Symptoms of cranial nerve affection :

Number	Nerve	Symptoms of Lesion
1	Olfactory	Anosmia, cacosmia
2	Optic	Acuity of vision, field defects
3,4,6	Occular	Diplopia
5	Trigeminal	Difficult mastication (motor) Face sensation (sensory)
7	Facial	Food accumulation in mouth
8	Cochleo-vestibular	-Diminished hearing (cochlear part) -Tinnitus, vertigo (vestibular part)
9,10 11,12	Glossopharyngeal & vagus Cranial accessory & hypoglossal	Bulbar S. $\Rightarrow$ dysphagia -dysarthria dysphonia (hoarseness) -nasal regurge

3-Symptoms of motor affection (Δ , extra Δ , cerebellum)

- a-Irritative lesion : convulsions, fasciculation, abnormal movements
- b-Destructive lesion : weakness, paralysis, gait changes
if so ask about : tone (hypo or hyper) - wasting - distribution (UL - LL -distal - proximal)

4-Symptoms of sensory affection :

- a-Irritative lesion : pain, paresthesia, hyperesthesia
- b-Destructive lesion : hyposthesia or anesthesia (superficial S.) +ve Rombergism (deep S.)

5-Symptoms of sphincteric troubles :

- a-Control of micturation (incontinence, precipitency) & defecation
- b-Impotence (in DM, MS)

D-Past history :

- 1-Trauma : disc prolapse
- 2-Fever : meningitis, encephalitis
- 3-Diabetes : P.neuritis
- 4-Hypertension : in stroke
- 5-TB : TB toxemia in paraplegia (Pott's), cerebellar ataxia (tuberculoma)
- 6-Syphilis : chancre, recurrent abortions in sensory ataxia (T.dorsalis)
- 7-Rh. fever : embolic hemiplegia, SA hemorrhage (in SBE), chorea
- 8-Chronic suppuration : bronchiectasis & otitis media in brain abscess, facial palsy
- 9-Similar attacks : in DS
- 10-Drug intake :

-Convulsion : ambilhar	-P.neuritis : INH , streptomycin
-Parkinsonism : major tranquilizer	-Myopathy : vincristine, steroids
-Cerebellar ataxia : hydantoin	

E-Family history : similar condition in family -consanguinity

GENERAL EXAMINATION

General Examination :

- 1-Face "appearance"
 - mask face in Parkinsonism
 - pallor in B12 deficiency (SCD)
 - angiomatic malformation : may point to similar lesion in brain
- 2-Skin :
 - pellagric rash
 - maculoanesthetic patches in Leprosy

Vital Signs :

- 1-Pulse : irregular "AF" in embolism
- 2-BP : hypertension in stroke

Heart Examination :

- 1-Valvular lesion : suggest embolism
- 2-Cardiomyopathy : associated with heredofamilial diseases

Local Examination : **include 10 items**

1-MENTAL FUNCTION

a-State of consciousness : Glasgow coma scale

Eye opening		Motor response		Verbal response	
Spontaneous	4	Spontaneous	5	Oriented to time & place	5
To speech	3	To order	4	Confused to time & place	4
To pain	2	Flex to pain	3	Inappropriate words	3
None	1	Extend to pain	2	Inappropriate sounds	2
		None	1	None	1

b-Orientation : for time, place, persons

c-Memory :

- 1-For recent events (lost = anterograde amnesia)
- 2-For remote events (lost = retrograde amnesia)
- 3-For localized events (lost = circumscribed amnesia) : lost memory in certain period of time

Commonest causes of amnesia :

- 1-Cerebral atherosclerosis
- 2-Frontal lobe lesion
- 3-Post concussion
- 4-Dementia (Huntington's chorea, pellagra)
- 5-Korsakow's syndrome due to chronic alcoholism (anterograde amnesia + confabulations + P.neuritis)

d-Intelligence : assessed by Intelligent quotient "IQ" test. Patient is considered of average intelligence when he & the doctor " understands " each other.

e-Mood : abnormalities include

- 1-Depression, euphoria , emotional lability
- 2-Apathy (indifference)

mood abnormality in : DS -Pseudobulbar palsy -cerebral atherosclerosis -psychosis & neurosis

f-Behavior & perception : ☺

- Behavior : general actions (sitting, talking, cooperation)
- Perception lesion : seen in psychiatric troubles frontal lobe lesion, atherosclerosis
 - 1-Hallucination : persisting non-existing stimulus (visual, auditory, gustatory, tactile)
 - 2-Illusion : misinterpretation of external stimulus
 - 3-Delusion : false fixed belief not correctable by reason & not shared by others of same culture
 - 4-Delirium : combination of
 - agitation (restlessness, hyperexcitability, illusion, hallucination)
 - disturbed consciousness
 - causes : fevers, alcoholism (delirium tremens) drug toxicity (atropine, amphetamine)

☞ **Mentally of normal patient : fully conscious, well oriented for time place & person, with normal behavior , mood & memory, cooperative & of average intelligence**

2-SPEECH

APHASIA : inability of formulation of speech, in absence of lesion of sense organs, or mental defect

1-Sensory aphasia :

- Visual : -visual agnosia : lesion in area 18,19 - patient see but does not recognize objects
- visual alexia : lesion in area 39 - patient see but does not recognize letters & numbers
- Auditory agnosia : lesion in area 22 - patient hears but does not understand sounds

2-Motor aphasia :

- Verbal aphasia : lesion in Brocca's area (44) - patient can't express his ideas in spoken word
- Writing aphasia (agraphia) : lesion in Exner's area (45) - patient can't express his idea in writing

3-Jargon's Aphasia : lesion in area (37)

patient can speak, but words are meaningless & have no relation to each other (word salad)

DYSARTHRIA : difficulty in articulation with normal formulation (i.e. normal speech center)

1-Slurred speech : bilateral pyramidal lesion

2-Staccato speech : cerebellar lesions

3-Monotonous speech : extra Δ lesion

3-CRANIAL NERVES EXAMINATION

1-OLFACTORY NERVE : test substance *should be* :

- 1-Familiar : coffee, peppermint
- 2-Non irritant (avoid 5th nerve irritation)
- 3-Test each nostril alone
- 4-Eyes should be closed

- Unilateral anosmia : -fracture skull base - basal meningitis
- Foster Kennedy syndrome
- Bilateral anosmia : local ENT causes - hysterical



2-OPTIC NERVE : examine for

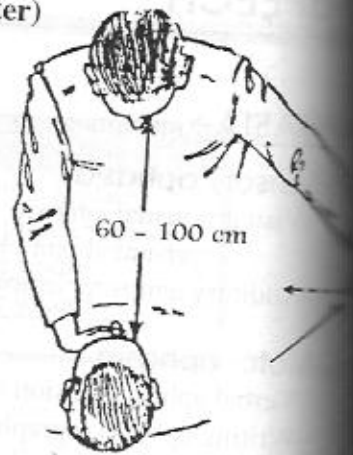
a-Acuity of vision : each eye separately

- Snellen's chart for > 6 m. distance
- Counting finger if < 6 m. distance
- Hand movement at 30 cm
- If hand is not perceived do perception of light (PL)
- No PL means blindness

b-Field of vision :**1-Central vision (Bjerum screen) & peripheral vision (Perimeter)****2-Confrontation test :**

- Sit at 60 - 100 cm from patient
- Eyes should be at same level
- One eye is closed & you close opposite eye
- Patient should concentrate on your eye
- Test field of vision in 4 directions by moving finger from periphery inwards

☞ Patient fields of vision are normal if he notices your finger at periphery the same time as you do

**c-Ophthalmoscope :** for papilledema, optic atrophy (see brain tumor)**d-Colour blindness tests :** for colour blindness**3, 4, 6 OCCULAR NERVES :****a-Examine for ptosis :**

- 1-Determine partial or complete ptosis - Abolish action of frontalis ms by pressing over superior orbital ms then ask patient to open his eyes If he can $\Rightarrow$ ptosis is partial
- 2-Compare between oculomotor palsy & sympathetic palsy (Horner's syndrome)

	3rd N. palsy	Sympathetic palsy
1-Ptosis	Complete	Partial
2-Pupil	Dilated (mydriasis) & fixed	Small (miosis)
3-Association	Divergent squint	Enophthalmos, anhidrosis

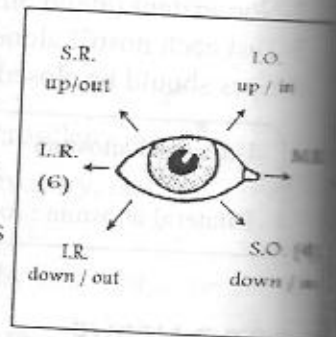
☞ Other causes of ptosis :

- Myasthenia graves (bilateral with normal pupil + other myasthenic manifestations + diurnal variation)
- Myopathy - motor neuron disease - congenital - traumatic

b-Extra ocular movements :

- 1-For each eye alone :
 - test trochlear (4th N. = SO) by looking to opposite shoulder (down & in)
 - test abducent (6th N. = LR) by looking lateral
 - test oculomotor (3rd N. = SR, MR, IR, IO) by looking in other directions

- 2-For conjugate deviation of eye (movement of both eyes) to test intact centers of conjugate movements (in brain stem, frontal & occipital lobe)

**c-Nystagmus :** ask Pt to look at your finger placed laterally, up then down

If nystagmus is present comment on :

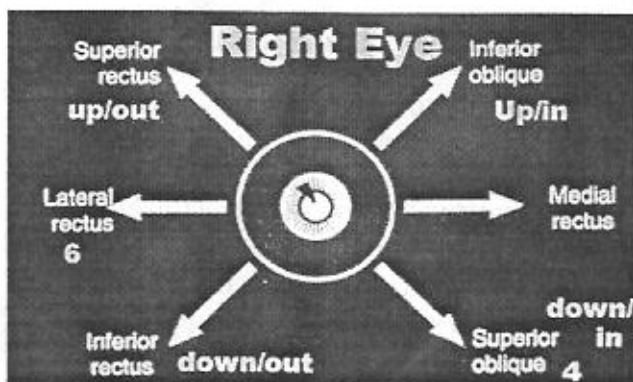
- 1-spontaneous or with fixation
- 2-uni or bilateral
- 3-if it has rapid & slow phase (*direction of nystagmus is that of rapid phase*)

Rt horner syndrome in a patient with bronchogenic carcinoma

Note ptosis & enophthalmos



Extra ocular Movement



d-Pupil : normal pupil is RRR (round, regular, reactive to light & accommodation)

1-LR : light on one eye lead to constriction of same eye (direct) & of opposite eye (consensual)

2-Accommodation (near) R. : finger approach to eye of patient from a far point - triad occur : convergence (2 MR) + miosis (CPM) + accommodation (ciliary ms. → convex lens)

3-Cilio-spinal reflex : pinching of skin on one side of neck results in dilatation of ipsilateral pupil. It is absent in sympathetic lesion (Horner's syndrome)

⊗ -In optic atrophy : absent direct & consensual LR

-In 3rd N. palsy : ipsilateral absent direct & present consensual LR - contralateral the reverse occurs

<i>Causes of mydriasis</i>	<i>Causes of miosis</i>
1-Physiological : fear, dim light	1-Physiological : sleep, bright light
2-3 rd N. palsy (parasymp. palsy)	2-Horner's syndrome (symp. palsy)
3-Holme's Adies pupil	3-Argyl - Robertson pupil
4-Optic N. atrophy	4-Pontine hemorrhage
5-Drugs : atropine, cocaine	5-Drugs : morphine, pilocarpine

5-TRIGEMINAL NERVE :

a-Sensory part : test for pain sensation (using a pin) to touch (using cotton) and compare both sides of face, inner and outer parts, each division of trigeminal N.

1-Ophthalmic : area limited by 2 lines; a line from the tragus of one ear to the tragus of other ear passing by the lambda & another line passing from the tragus to outer canthus of eye

2-Maxillary : area limited bet. the above line & line drawn from tragus to corner of mouth

3-Mandibular : area limited between the above line & the border of the lower jaw except a small area at angle of mandible (*supplied by C2*)

b-Motor part : test for muscles of mastication

1-Temporalis : inspect hollowing - clench jaw + palpate ms

2-Masseter : inspect hollowing - clench jaw + palpate ms, holding its ant. & post. borders

3-Pterygoids : fix head + open mouth

-In unilateral paralysis $\Rightarrow$ the jaw is deviated to diseased side

-In bilateral paralysis $\Rightarrow$ inability to open mouth

c-Reflexes :

1-Superficial : corneal & conjunctival reflexes (aff. ophthalmic division of 5 / eff. 7 bilaterally)

Ask patient to look up & in - touch eye from lateral side to avoid photic stimulation

-Normal : stimulation of 1 eye results in blinking of both eyes

-Facial palsy : absent blinking in same eye

-Absence of blinking in both eye is seen in :

-sensory trigeminal affection of stimulated side

-bilateral facial palsy

-organic type of coma

2-Deep reflex : "jaw R." (aff. 5 / eff. 5) - open mouth slightly, place index finger over lower jaw and tap from above downward.

-Normally absent or minimal (pathological R.)

-Exaggerated R. = bilateral UMNL above pons (e.g. in pseudobulbar palsy)

EXAMINATION OF TRIGEMINAL NERVE

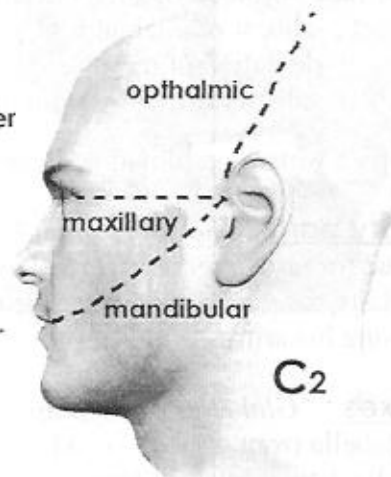
I-SENSORY

COMPARE:

a- both sides

b- inner and outer

c- each division



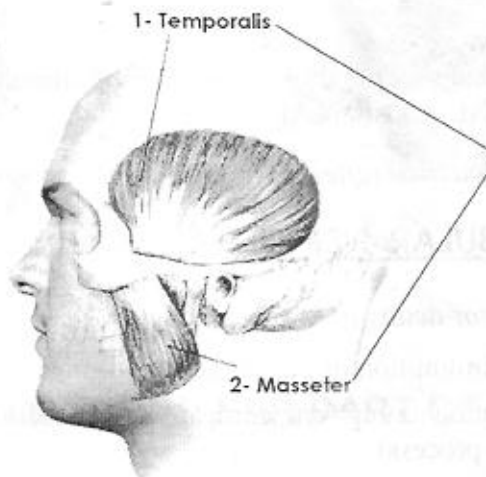
II-MOTOR

1- Temporalis

clench jaw

3- M&L Pterygoids

Open mouth+Fixed head



2- Masseter

III-REFLEX



1- Superficial:
Corneal & Conjunctival (5/7)



2- Deep jaw reflex (5/5)

7-FACIAL NERVE :**a-Motor part :** muscles of expression of face ☺

1-Upper face : frontalis & orbicularis oculi

-inspect : absent forehead wrinkle - infrequent blinking & epiphora

-test for : raising eye brow and firm closure of eye lids

2-Lower face : orbicularis oris, buccinator, retractor anguli

-inspect : -absent nasolabial fold, dropping of angle of mouth present in facial palsy

-deviation of mouth angle to healthy side

-salivary dribbling from diseased side

-test for : whistling, blowing of cheeks & showing teeth - platysma

b-Sensory part : "chorda tympani"

Examine for taste over anterior 2/3 of tongue by drying tongue & applying a drop of sweat, bitter, salty substance over each side of tongue separately & see if patient can recognize them (by raising his arm)

c-Reflexes : "Glabellar - nasopalpebral R." (Aff.Cr. 7 / eff.Cr.7)

-Tap glabella (root of nose - can be done by finger) while patient passively close his eye.

Normally there is bilateral contraction of orbicularis oculi. Blinking stops after 2-3 contractions (due to habituation)

-Abnormalities includes :

-parkinsonism : blinking continues with taps as long stimulus is applied

-exaggerated in UMNL & lost in LMNL

☞ Corneal & conjunctival reflexes can be considered here as 7th N. Reflexes

8-COCHLEO - VESTIBULAR NERVE = "Stato -Acoustic nerve"**a-Cochlear part :** test for acuity of hearing using :

-Watch test : if there is diminution of patient acuity for hearing do the following test

-Rinne's test : using vibrating tuning fork, compare air conduction (in front of ear) with bone conduction (on mastoid process)

-Weber's test : place tuning fork in the middle of head

	<i>Watch Test</i>	<i>Rinne's Test</i>	<i>Weber's Test</i>
Normal	Acuity of pt. hearing is similar to that of examiner	Air conduction is better than bone conduction	Vibrations are heard in the middle of fore head
Conductive deafness	Pt. hearing is less than examiner	Bone is better than air	Vibrations are heard in affected ear
Nerve deafness	As above	Both air & bone are ↓	Vibrations are heard in normal ear

b-Vestibular part :

1-Caloric test

2-Rotating chair : electronystagmography (ENG)

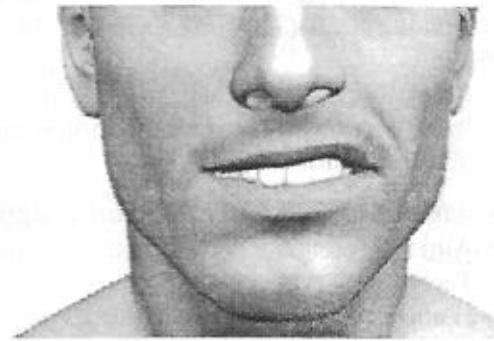
3-Nystagmus (see cerebellum)

EXAMINATION OF FACIAL NERVE

I- MOTOR

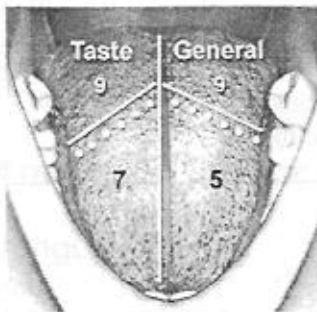


a-upper face



b-lower face

II- SENSORY



Chorda
Tympani



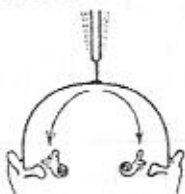
Glabellar
Reflex
(7/7)

EXAMINATION OF COCHLEAR PART OF 8th NERVE

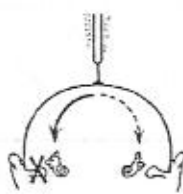
1- RINNE'S TEST



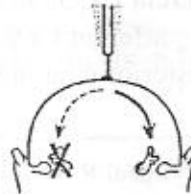
2- WBER'S TEST



Normal



Conductive Deafness



Nerve Deafness

Vestibular System Evaluation

Caloric test :

- 1-Aim : assess function of internal ear
- 2-Technique : patient lies supine, his head flexed 30° and each ear is douched with water for 40 seconds : 30° C (7° below normal) - 44° (7° above normal)
- 3-Results :
 - normally : nystagmus appear for 2 minutes
 - hypofunction : nystagmus duration is diminished
 - dead labyrinth : no response.

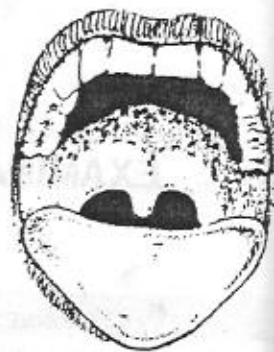
Bed side test to evaluate vestibular functions :

- 1-Aim : differentiate between causes of nystagmus
- 2-Technique :
 - Patient lie on his back, with his shoulder at the end of the bed. His head, projecting beyond bed, is supported by examiner hand
 - Head is then fully extended and turned to one side
 - Patient's eye should remain open
 - After a short interval, test should be repeated with head extended and rotated to other side
- 3-Results : normally : no nystagmus
 - Nystagmus (may appear within 10 seconds) :
 - if it remains < 1 minute : lesion in inner ear (same side)
 - if it remains > 1 minute : lesion in 8th nerve or cerebellum

9,10 : GLOSSOPHARYNGEAL & VAGUS NERVES :

-Motor :

- Pt open his mouth & say "Ah", with a good illumination - observe palatal and uvular movements
- Normally : symmetrical elevation of soft palate - central uvula
 - Lesion :
 - unilateral LMNL : uvula deviation to *healthy side*
 - bilateral UMNL or LMNL : central non mobile uvula
- "differentiated by palatal & pharyngeal reflexes"



-Sensory : taste sensation in post 1/3 of tongue

-Reflex :

- Palatal reflex (afferent Cr. 5 / efferent Cr. 10) : stimulation of soft palate leads to its elevation
 - Pharyngeal reflex : afferent Cr.9 / efferent Cr.10
- Stimulation of posterior pharyngeal wall lead to local contraction & gag reflex

- ⊗ 1-Palatal & pharyngeal R. are exaggerated in pseudobulbar palsy & lost in true bulbar palsy
- 2-Isolated "9" lesion is not known as it is usually damaged with 10 & 11 N. Lesion at jugular foramen
- 3-Isolated "10" lesion : occur in cases of indirect laryngoscope

11: ACCESSORY NERVE :

-Cranial accessory nerve : distributed with vagus nerve

-Spinal accessory :

1-Sternomastoid :

- inspection : head tilt to affected side
- tested by asking patient to turn his chin against resistance

2-Trapezius :

- inspection : shoulder depression
- tested by elevation of shoulder against resistance

**12 : HYPOGLOSSAL NERVE :**

-Motor : tongue muscles

-Sensory :

- ant 2/3 : taste sensation : 7th N -general sensation : 5th N
- post 1/3 : taste & general sensation : 9th N

-Power of ms : ask patient to push inner side of cheek by his tongue against resistance

-Inspect tongue for :

1-Deviation

*UMNL :

- unilateral : deviation to opposite side of lesion
- bilateral : inability to protrude tongue (spastic tongue)

*LMNL :

- unilateral : deviation to same side of lesion
- bilateral : inability to protrude tongue



2-Wasting : in LMNL

3-Fasciculation : in MND, syringobulbia (tongue should be inside mouth)

4-Abnormal movement : in chorea

5-Dimpling on tapping : in myotonias

6-Others : red glazed (vit deficiency), fissured in mongolism , ulcers in Behcet's disease

4-EXAMINATION OF MOTOR SYSTEM

INSPECTION

a-State of muscles : normal, wasted, hypertrophied

- ✿ *In wasting describe :* limb, side (uni or bilateral), symmetrical or not, distal or proximal
- ✿ *In hypertrophy :* ↑ power in true hypertrophy, ↓ power in pseudohypertrophy
- ✿ *Common attitudes & posture :*
 - hmiplegia : flexed UL, extended LL
 - paraplegia in flexion : flexed LL -Paraplegia in extension : extended LL
 - parkinsonism : Gorilla like (general slight flexion)
 - LMNL : foot or wrist drop
- ✿ *Diagnosis of atrophy or wasting :*
 - unilateral by measurement at identical sites
 - bilateral : LL start at vastus medialis - UL : start at interossei, thenar, hypothenar
- ✿ *Causes of muscle wasting :* measured by a tape at similar areas
 - bilateral, symmetrical, proximal : myopathy
 - bilateral, symmetrical, distal : PN (inverted champaign bottle in peroneal muscle atrophy)
 - diffuse : UMNL
 - patchy or segmental : AHCs lesions
 - Generalized : elderly, malnutrition, malignancy
- ✿ *Hypertrophy :* true ⇒ with increased power - false "pseudo" ⇒ with decreased power - *causes are :*
 - segmental : Duchenne & Becker myopathy
 - generalized : myotonia congenita "young Herculean" - myxedema - acromegaly

b-Fasciculations : spontaneous contraction of group of muscle visible & palpable

Fibrillation : as fasciculation but in single muscle fiber (seen in tongue)

	<i>Physiological fasciculation</i>	<i>Pathological fasciculation</i>
1-Cause	Anxiety, fatigue, coffee, smoking	Irritation of AHCs
2-Type	Coarse	Fine
3-Wasting	Absent	Present
4-EMG	Normal	Giant potentials

c-Involuntary movements : chorea, athetosis, tremors -Characters :

- Static or kinetic
- Fine or coarse (flappy)
- Regular or irregular - Rapid or slow
- Form : pill-rolling : parkinsonism
- Jerky : chorea
- Ppt & relieving factors : in extra Δ lesion $\uparrow$ by emotion, fatigue & $\downarrow$ by activity, sleep
- Associated symptoms : rigidity, spasticity

TREMORS

-Definition : rhythmic oscillatory movements of peripheral parts of body (lips, tongue, hands & fingers)

-Causes :

- 1-Anxiety, fatigue & excess coffee, tobacco
- 2-Senile
- 3-Essential (familial)
- 4-Hysterical : irregular, in front of audience
- 5-Toxic : alcohol, mercury, cocaine
- 6-Hyperthyroidism : in outstretched hands - other features of thyrotoxicosis are present
- 7-Flapping tremors "asterexis" : in organ failure : hepatic F., renal F., respiratory F.
- 8-Parkinsonism : static (at rest & disappear by movement)
- 9-Kinetic "intention" tremors : during movement - in cerebellar ataxia

d-Skeletal deformities :

- pes cavus (high arched foot)
- pes plannus (flat foot)
- hallux valgus or varum
- abnormal position (claw hand, dropped foot)

* **Causes of pes cavus :**

- 1-Duchenne myopathy
- 2-Fredriech's ataxia
- 3-Syringomyelia
- 4-Peroneal ms atrophy
- 5-Severe wasting of intrinsic foot muscles

e-Trophic changes :

Fall of hair, thin skin, loss of SC fat, brittle nails, trophic ulcers, Characot's joint

* **Diseases with marked trophic changes :**

- 1-Peripheral neuritis esp. diabetic, leprotic
- 2-Cauda equina
- 3-Syringomyelia
- 4-Tabes dorsalis

2-PALPATION

A-EXAMINATION OF MUSCLE TONE

Methods : = 4

- 1-Passive flexion & extension : for all joints
- 2-Shaking methods : for wrists and ankles
- 3-Gower's method : for shoulder "lift shoulder up & down from axilla"
- 4-Sudden lifting of legs : for both LL - cadaveric position "frog like" in hypotonia

Causes of hypotonia : = 5

- 1-LMNL
- 2-Shock stage of UMNL
- 3-Cerebellar ataxia
- 4-Post. column lesion
- 5-Rheumatic chorea

Causes of hypertonia = most important 2 are :

	1- UMNL (spasticity)	2- Rigidity
Cause	Pyramidal lesion	Extrapyramidal lesion
Distribution	1-Antigravity ms : flexors of UL extensors of LL & trunk 2-Distal > proximal	1-Antigravity & progravity ms flexors of UL, LL & trunk 2-Proximal > distal
Character	Clasp - knife	Lead pipe or cog wheel
Deep reflexes	Hyperreflexia	Hyporeflexia

Other causes of hypertonia :

- 3-Hysterical
- 4-Myotonia
- 5-Catatonia
- 6-Meningeal irritation

EXAMINATION OF UPPER LIMB



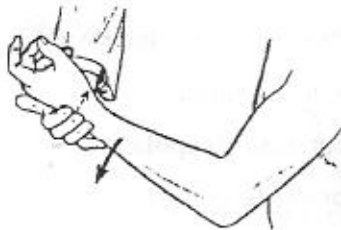
Shoulder
Adduction



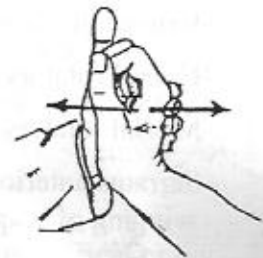
Shoulder
Abduction



Elbow
Flexion



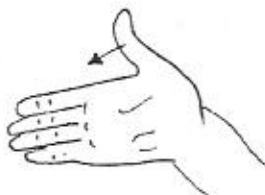
Elbow
Extension



Wrist
Flexion & Extension



Opponens
Pollicis



Abductor Pollicis
Brevis



Abductors
&
Adductors



Lumbricals

B-EXAMINATION OF MUSCLE POWER

-Upper limb & shoulder girdle

*** Shoulder : C4-C5**

-Adduction : pectoralis major (mainly) - {Others $\Rightarrow$ P.minor, latissimus dorsi, teres major}
Ask patient to adduct his arms against resistance or while patient is pressing his hands to his waist & palpate anterior axillary fold (contracted P.major)

$\approx$ *Latissimus dorsi* : tested by holding post.fold of axilla while patient is coughing

-Abduction : 0° - 15° supraspinatus
15° - 90° deltoid
90° - 180° trapezius

to test abduction ask patient to lift his arm straight out at right angles to his side

-Flexion : deltoid (ant. fibers) : raise arm forward against resistance

-Extension : deltoid (post. fibers) : raise arm backward against resistance

-Lateral rotators : infraspinatus, teres minor

-Medial rotators : latissimus dorsi, subscapularis

-Serratus anterior : push arm forwards against resistance - paralysis of this muscle lead to winging of scapula

***Elbow joint : C 5,6,7**

-Flexors : brachialis, brachioradialis $\Rightarrow$ flex elbow against resistance

-Extensors : triceps $\Rightarrow$ extend elbow against resistance

***Wrist : C7,8 : flex & extend against resistance with fist closed**

***Hand : C8, T1**

-Opponens pollicis (thumb) : touch tip of little finger with tip of thumb

-Abductor pollicis brevis (thumb) : abduct thumb at right angle to palm

$\approx$ "only ms of hand supplied by median N."

-Other fingers :

-abductors : dorsal interossei

-adductors : palmar interossei

-lumbricals : writing position

-Abdominal muscles T6-T12 : put hands over chest with attempts to sit up

-Lower limb***Hip :**

- Flexion : ileo-psoas (L1,2) - flex hip against resistance
- Extension : gluteus maximus (L5,S1) - with face down, fix trunk & ask patient to raise LL against resistance
- Adduction : adductor longus, brevis, magnus - assisted by pectineus & gracilis (L2,3,4)
- Abduction : gluteus medius & minimus (L4,5,S1)

***Knee :** extension : quadriceps (L2,3,4) - Flexion : hamstrings (S1,2)

***Ankle :**

- Dorsiflexion : anterior tibial group (L4,5) "tibialis anterior, extensor hallucis longus, extensor digitorum longus"
- Plantar flexion : calf muscles (S1,2) "gastrocnemius, tibialis posterior"
- Inversion : T. anterior, T. posterior (L4)
- Eversion : peroneal muscles (L5)

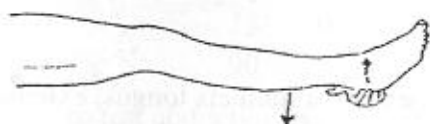
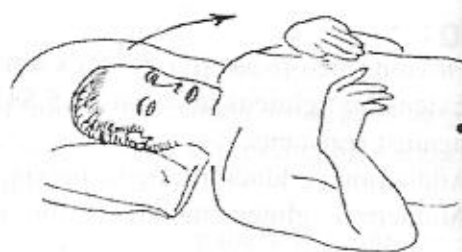
Grades of ms power & reflexes :

- All muscles should be tested against resistance of their direction of action
- Comment on pattern of weakness : uni or bilateral, distal or proximal, symmetrical or not
- Comment on grades of ms power & reflexes (MRC scale - Medical Research Council "UK")

<i>Grade of ms power</i>	<i>Grade of reflexes</i>
0 No muscle contraction visible (complete paralysis)	0 Areflexia
1 Ms contraction visible without joint movement (flicker)	1 Hyporeflexia
2 Joint movement after elimination of effect of gravity	2 Normal
3 Movement against gravity, but not against resistance	3 Hyperreflexia
4 Movement against resistance, but weaker than normal	4 Clonus
5 Normal	

EXAMINATION OF ABDOMINAL MUSCLES & LL

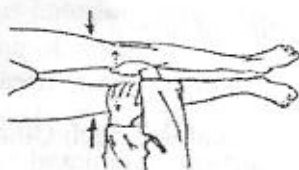
Abdominal muscle examination



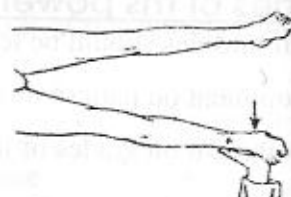
Hip Flexion



Hip Extension

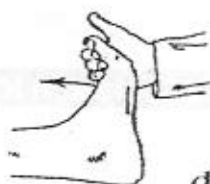


Hip Adduction



Hip Abduction

Knee flexion



Ankle dorsiflexion



Ankle Planter flexion

DEEP REFLEXES & CLONUS



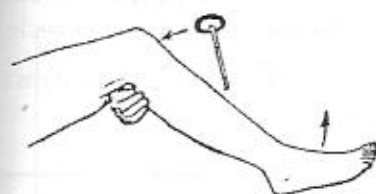
**Biceps
Reflex**



**Brachioradialis
Reflex**



**Triceps
Reflex**



**Knee
Reflex**



**Ankle
Reflex**

Remember

1-Test for fatiguability : in fluctuating ms power to *exclude myasthenia* $\Rightarrow$ ask patient to :

- look up for 1 min. (ptosis will occur)
- abduct shoulder at 90° for 1 min.
- blow cheeks against resistance

2-Tests for myotonia :

- Voluntary myotonia : after clench fist, pt is unable to open hand except very late
- Mechanical (percussion) myotonia :
 - Tap of thenar eminence, leads to adduction of thumb with delayed abduction
 - Tap of the tongue leads to dimple formation

3-Tests for myopathy

- Gower sign (climbing test)** : pt climbs on himself on getting up (weak gluteus maximus & spine extensors)
- Waddling gait** : weak gluteus medius & minimus
- Exaggerated lumbar lordosis** : weak back extensors
- Pot belly abdomen** : weak abdominal muscles
- Winging of scapula** : weak serratus anterior & trapezius
- Rhomboids ms** : ask patient to catch his hands posteriorly
- Latissimus dorsi** : catch post axillary fold and ask patient to cough to feel contraction of muscle (while patient clasping his hands behind his back)
- Clavicular head of pectoralis major** : not affected in myotonia nor myopathy - ask patient to stretch his arms in front of him and then to clap his hands, muscle can be palpated below medial 1/2 of clavicle.
- Beevor's sign** : ask patient to sit. If umbilicus is sifted upward, weakness more in lower abdominal ms i.e. "pelvic girdle type". It is also useful to detect level of lesion in spinal cord.

3-REFLEXES

A-DEEP REFLEXES

***IN UPPER LIMB**

1-Biceps reflex : C5,6

Tap on your finger placed on biceps tendon with elbow flexed at 120° . Mild flexion occur

2-Brachioradialis or supinator R. : C5,6

Tap 3-4 cm above styloid process of radius, with elbow flexed at 120° . Mild flexion occur

3-Inverted supinator R.: in lesion of C5 (as cervical spondylosis) there is

- a-Lost biceps R.
- b-Exaggerated triceps R.
- c-On eliciting biceps or brachioradialis R., finger flexion occur (instead of elbow flexion)

4-Triceps reflex : C6,7 Tap on triceps tendon with elbow flexed at 90° slight extension occur

5-Supraspinatus & finger R. : absent normally - If present they indicate UMNL

- * Supraspinatus R. C3,4 : tap supraspinatus ms, if +ve visible contraction occur with slight shoulder abduction
- * Finger R. C8 , T1 : tap palmar surface of middle 3 fingers while they are slightly flexed, if +ve flexion of fingers occur

***IN LOWER LIMB**

1-Knee reflex : L2,3,4

Tap quadriceps tendon with flexed knee supported by your hand : contraction of quadriceps with knee extension occur

2-Ankle reflex : S1,2

Tap on tendo-Achilles with thigh abducted & internally rotated, the knee is flexed at 90° and the ankle is dorsiflexed. Contraction of calf muscles occur with plantar flexion of ankle.

3-Patellar reflex & Adductor reflex :

They are normally absent. If present they indicate UMNL

- * Patellar R. (L2,3,4) : press the upper border of patella downwards by index, and tap fingers with hammer. If +ve there is contraction of quadriceps & upward patellar displacement
- * Adductor R. (L4) : tap index finger placed just above adductor tubercle with hip externally rotated and slightly abducted. If +ve there is contraction of adductors with thigh adduction

- 1-In deep R : expose muscle to observe movement at joint as well as muscle contraction
- 2-In absent Reflex : repeat after "reinforcement" or Jendrassik's maneuver. Ask patient to clench his teeth or clutch his hands together
- 3-In hyperreflexia : elicit clonus & pathological reflexes

CLONUS : rhythmical series of contraction in response to sudden sustained stretch of ms tendon

-Organic clonus : occur in UMNL & is abolished by release of ms stretch

-Hysterical clonus : persist inspite of release of ms stretch

-Ankle clonus : passive plantar flexion of joint followed by sudden dorsiflexion

-Patellar clonus : displace patella upwards, followed by sudden downward displacement

-Wrist clonus : sudden sustained extension of wrist

-Causes of hyperreflexia :

1-UMNL (spasticity)

2-Rigidity : extra pyramidal "parkinsonism"

3-Others : thyrotoxicosis, tetany, drug addict, catatonia, myotonia, meningeal irritation , hysterical

-To diagnose UMNL : hyperreflexia + spasticity + weakness + Babinski

-Sure signs of pyramidal lesion UMNL :

- 1-Plantar reflex (Babinski)
- 2-Organic sustained clonus
- 3-In bilateral pyramidal lesion : precipitancy - exaggerated jaw jerk

-Causes of hyporeflexia :

- 1-LMNL lesion
- 2-Post root affection : tabes dorsalis
- 3-AHCs : poliomyelitis
- 4-Myxedema : delayed reflex
- 5-Cerebellar ataxia (pendular jerk)
- 6-Chorea (pendular jerk)
- 7-Cold exposure (hypothermia)

-Hypertonia & hyporeflexia : parkinsonism**PATHOLOGICAL REFLEXES**

-Definition : normally absent - if exaggerated they denote UMNL

-UL :

- 1-Supraspinatus (scapular) reflex (C3, 4)
- 2-Finger R. (C8-T1)
- 3-Hoffman's R.: flex distal IP of patient index or middle finger then flick terminal phalanx into extension In hyperreflexia thumb quickly flex in response to this maneuver
- 4-Deltoid R. : place index across tip of shoulder (on deltoid ms belly) , then tap finger with hammer
- 5-Pectoralis R. : place index & middle finger on lateral border of pectoralis ms , then tap finger with hammer
- 6-Positive grasping & groping

-LL :

- 1-Patellar ref. (L2, 3, 4)
- 2-Adductor ref. (L4)

-Others :

- 1-Glabellar reflex
- 2-Pouting R. : tapping lips with a hammer results in a pout response
- 3-Palmo-mental R. : quick scratch on palm of hand results in a sudden contraction of mentalis ms in chin

B-SUPERFICIAL REFLEXES

1-Abdominal reflexes : T6-T12 - stroking skin by a pin from periphery inwards

-upper abdominal R. : T6-T8

-middle abd. R.: T8-T10

-lower abd. R.: T10-T12

-normal response is by shift of umbilicus towards site of stimulation



2-Cremasteric R. : L1

stroke skin of upper part of medial aspect of thigh. This result in contraction of cremasteric ms

3-Gluteal R. : L4,5 - stroke across 1 buttox result in contraction of gluteal ms

4-Anal R. : S3,4,5 : stroking across buttox result in contraction of external anal sphincter

5-Corneal, palatal, pharyngeal R. : are considered sup.R. (see before)

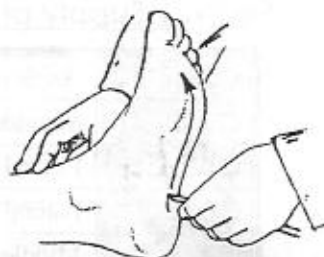
- ✎ Superficial reflexes are absent in UMNL above level of segmental supply of reflex or in LMNL affecting the reflex arc itself

6-Plantar reflex : S1,2 elicited by

a-Babinski method :

scratch of lateral aspect of foot result

normally in plantar flexion of toes



b-Shaddock : scratch on lateral aspect of dorsum of foot from lateral malleolus to little toe

c-Oppenheim's : firm pressure on skin of lower part of shaft of tibia from above down

d-Gordon's : pinch firmly the tendo-Achilles

e-Gonda's : passive flexion of 3rd & 4th toes, then release suddenly.

f-Straniski : abduction followed by sudden release of little toe

**It there is dorsiflexion with or without fanning of toes, it denotes UMNL*

CAUSES OF

-Extensor planter response (+ve Babinski sign)

1-UMNL 2-Infants (1st year of life) 3-Under anesthesia 4-Deep sleep 5-Deep coma

-Lost abdominal reflexes :

1-UMNL above segmental supply of reflex

2-LMNL affecting reflex arc itself

3-Severe weakness & wasting of muscles e.g. myopathy

4-Obesity & ascites

-Exaggerated abdominal reflexes : psychoneurosis

-Equivocal planter response :

1-LMNL at S1

2-Decreased superf. sensation over the sole (S1)

3-Total paralysis of extensors of big toe e.g. myopathy

4-Marked foot deformities

5-EXAMINATION OF SENSORY SYSTEM

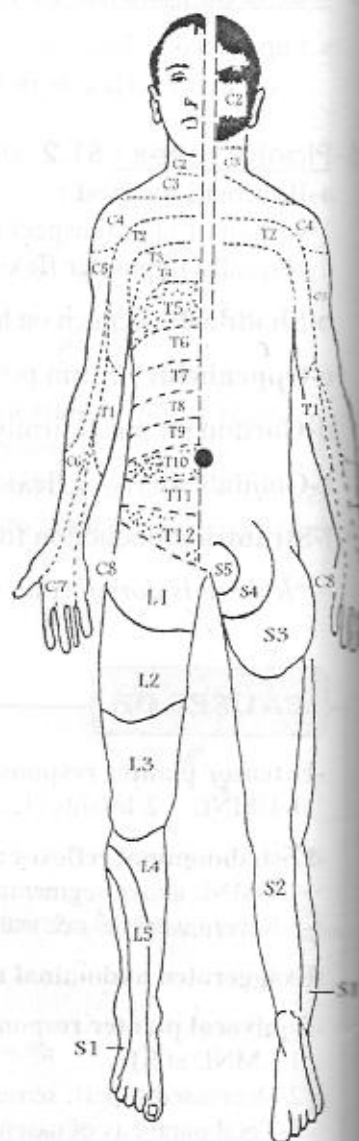
A-SUPERFICIAL SENSATION

- **Pain** using pin prick
- **Touch** using a piece of cotton
- **Temperature** using hot & cold test tubes

- a-Compare both sides of body (leg to leg, arm to arm) to detect hemihypoesthesia in hemiplegia
- b-Descending search to detect level (in focal paraplegia) jacket sensory loss (intramedullary lesion), stock & glove hyposthesia (in P. Neuropathy)
- c-Compare different dermatomes (for radicular sensory loss), test sensation all around limb

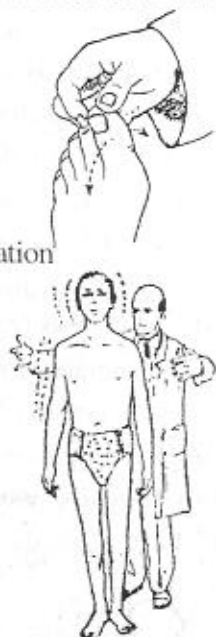
Sensory Supply of Body

C2	Angle of jaw, lateral aspect of neck
C3,4	Shoulder, down to manubrium
C5	Lateral aspect of arm
C6	Lateral aspect of forearm, thenar eminence & thumb
C7	Middle aspect of forearm, middle of palm, middle 3 fingers
C8	Medial aspect of forearm, hypothenar & little finger
T1	Medial aspect of arm
T2 -T7	Thorax (T5 → nipple)
T8 -T12	Abdomen (T10 → umbilicus - T12 → inguinal ligament)
L1	Upper 1/3 front of thigh
L2	Middle 1/3 front of thigh
L3	Lower 1/3 front of thigh
L4	Anterolateral aspect of thigh, front of knee, med. aspect of foot & middle 3 toes
L5	Lat. aspect of thigh, lat. aspect of leg, middle 1/3 of dorsum of foot & big toes
S1	Lat. thigh, middle aspect of leg, middle 1/3 of dorsum of foot & middle 3 toes
S2	Posterior aspect of thigh, leg & sole of foot
S3,4,5	Anal, perianal & gluteal region (saddle area) in concentric manner



B-DEEP SENSATION

- 1- **Vibration sense** : vibrating fork placed over bony prominence (medial malleolus, anterior tibial tubercle, ASIS, costal margin, clavicle)- If decrease over medial malleolus check ASIS. If lost, indicates post column affection & if intact it indicates PN
- 2- **Joint sense** : "sense of position & movement" -Hold big toe from the sides (or index finger in UL) & dorsiflex or plantar flex. Ask patient - with closed eye - if he feels it moving & if so in which direction
- 3- **Muscle sense** : done by pinching calf. Normal if patient feel disagreeable sensation
 -If lost = *Abadie's* sign in neurosyphilis
 -If tender = DM, DVT, myositis, Landry-Guillan Barre'
- 4- **Nerve sense** : press ulnar nerve or lateral popliteal N. against bone. Normally it results in electric - like sensation
- 5- **Rombergism** : ask pt. to stand with closed eyes
 In deep S loss he is going to fall on ground



- ✎ -Deep sensory loss occur in posterior column lesion as in DM, T.dorsalis, SCD
 -In deep S. loss finger to nose test is +ve while pt. is closing his eyes not while he is opening it
 -Causes of thickened nerves :
 1-Interstitial polyneuropathy
 2-Peroneal ms atrophy
 3-Amyloidosis
 4-Acromegaly
 5-Myxedema
 6-Neurofibromatosis

C-CORTICAL SENSATION

Done if superficial & deep sensation are intact with eye closed

- 1- **Tactile localization** : localize the site of pin prick over body
- 2- **Tactile discrimination** : "2 points discrimination"
 localize 2 stimulation pin pricks. Normally they can be felt distinct provided there is minimal distance between them i.e. 5 mm on finger & 5 cm over back
- 3- **Perceptual rivalry** : "sensory in attention"
 2 simultaneous pricks at 2 corresponding sites of body are felt on each side at same moment.
- 4- **Stereognosis** : recognition of a familiar object in hand (e.g. a key)
- 5- **Graphosthesia** : recognition of a number or letter drawn on hands

PATTERNS OF SENSORY LOSS :

- 1-Mononeural (e.g. ulnar N. lesion)
- 2-Stock & glove (P.N.)
- 3-Patchy loss (leprosy)
- 4-Radicular loss (root lesion)
- 5-Level (tract lesion - paraplegia)
- 6- Jacket with sleeve (intramedullary lesion)
- 7-Hemianesthesia (hemiplegia)
- 8-Crossed hemianesthesia (PICA occlusion)
- 9-Brown - Sequard syndrome
- 10-Saddle loss (cauda & conus)
- 11-Dissociated loss (syringomyelia)
- 12-Deep sensory loss (SCD)
- 13-Thalamic loss (thalamic syndrome)
- 14-Cortical sensory loss (post central gyrus lesion)
- 15-Face : loss of inner sensation in Tabes dorsalis - loss of outer sensation in syringobulbia



1-Mononeural



2-Stock & glove



3-Patchy



4-Radicular



5-Level



6- Jacket with sleeve



7-Hemianesthesia

8-Crossed
hemianesthesia9-Brown-Sequard
syndrome

10-Saddle

Causes of dissociated sensory loss "Loss of pain & temp. with preserved touch"

- | | |
|---------------------------------|--|
| 1-Syringomyelia & syringobulbia | 2-Brown Sequard syndrome |
| 3-Intramedullary tumors | 4-Cerebellar artery occlusion syndrome |

Causes of tender calf muscles :

- | | |
|--------------------------|---------------------------------|
| 1-Diabetic neuropathy | 2-Landry-Guillan-Barre syndrome |
| 3-Nutritional neuropathy | 4-Others : DVT & myositis |

6-EXAMINATION OF COORDINATION

-In cerebellar ataxia : tests are +ve with opened eyes & ↑ with eye closure

-In Sensory ataxia tests are +ve only with eye closure

1-Eye : nystagmus

2-Tongue : staccato speech

3-Neck : nodding

4-Trunk : titubation

5-Limb : intention " kinetic tremors "

-In UL :

a-Finger - to nose test : tip of finger from a distance $\Rightarrow$ nose

b-Finger - to finger test : each tip of his forefinger travel to meet each other in midline

c-Finger - to doctor's finger test.

d-Dysdiadokokinesia : inability to perform rapid alternating movement e.g. pronation & supination

e-Rebound phenomenon : with sudden release of flexed elbow, the forearm may hit patient face

f-Buttoning and unbuttoning test : earliest sign

-In LL :

a-Standing : swaying (trunkal ataxia)

b-Walking along straight line (Gait)

c-Rombergism

d-Heel - to knee test : patient raises his leg, brings down its heel onto his other leg & slides it down along shaft of tibia

e-Hypotonia & hyporeflexia -Pendulous knee jerk



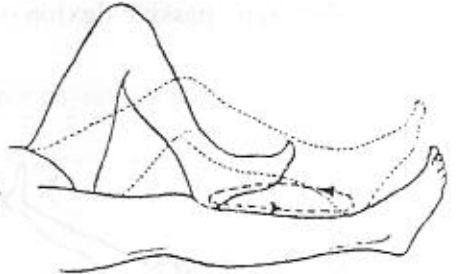
Finger to nose



Rebound



Adiokokinesia



Heel -to-Knee

7-EXAMINATION OF BACK & SPINE

- 1-Tenderness
- 2-Deformity
- 3-Hair tuft (spina bifida)
- 4-Swelling
- 5-Abnormal pigmentation "cafe' au lait" of Neurofibroma

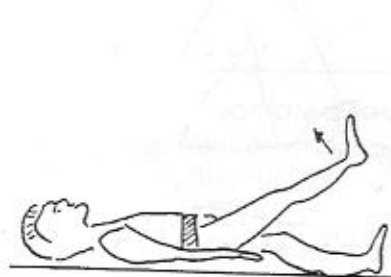
8-EXAMINATION OF CRANIUM

- 1-Size
- 2-Shape, sutures, fontanel
- 3-Bony bosses e.g. meningioma
- 4-Tenderness, dilated veins, arterial bruit, nevi
- 5-McEwen sign in brain tumors

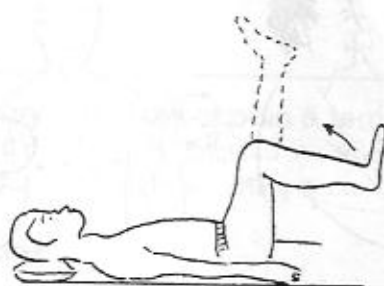
9-EXAMINATION OF NECK

Meningeal irritation signs : +ve in meningitis, sciatica, subarachnoid hemorrhage

- 1-Neck rigidity
- 2-Opisthotonus (high arched back)
- 3-Lassegue's sign : raise the leg of a supine patient by flexion of hip (while the knee is extended) normally it can be raised to 90° without discomfort. Here it is painful & limited
- 4-Kernig's sign : flex hip & knee at 90° in supine patient. Trial to extend slowly is limited & painful
- 5-Brudzinski's sign :
 - neck sign : passive flexion of neck leads to flexion of both knees and hips
 - leg sign : passive flexion of one hip leads to flexion of the other hip and knee



Lassegue's



Kernig's



Brudzinski's

10-EXAMINATION OF GAIT

Done if pt can walk

Lesion	Cause	Gait
1-UMNL a-Unilateral b-Bilateral	Hemiplegia Paraplegia	Circumduction Scissors
2-LMNL a-Muscle b-Periph. Nerve	Myopathy P.N.	Waddling High steppage
3-Post. Column	SCD - Tabes	Stamping = strike forcibly ground
4-Cerebellum a-Archicerebellum b-Neocerebellum -Unilateral -Bilateral	Friedrich's ataxia Cerebellar astrocytoma Marie's ataxia	Wide base "drunken" Deviation to one side Zigzag
5-Extra Δ	Parkinsonism	Short steppage (mild) Shuffling or festinate (severe)
	Chorea	Dancing
6-Hysterical	Psychological : bizarre, non-injurious & suggestible e.g. : -Pushing the paralyzed limb in front or dragging it behind -Astasia abasia : inability to stand or walk -Tandem walking : ask for heel to toe walk - This exaggerate instability	

Diagnosis of Neurological Case

1-Etiological Diagnosis : heredofamilial - symptomatic (vascular, traumatic, inflammation)

2-Anatomical Diagnosis : where is the lesion : Cortical, spinal cord, cerebellum

3-Pathological Diagnosis : what is the lesion

- Focal : affection of anatomically adjacent structures
Usually asymmetrical - with sensory or motor level
- Systemic : affection of physiologically related systems
-Usually bilateral & symmetrical - without a level
-Gradual onset & slowly progressive course
- Disseminated : affection of > 1 focus which are neither anatomically nor physiologically related
-usually asymmetrical
-without a level
-rapid onset & intermittent course

4-Functional Diagnosis :

- Stage : stage of neuronal shock -stage of neuronal recovery -stage of improvement with residual
- Paralysis
- Complication

DIAGNOSIS OF IMPORTANT LESIONS

HEMIPLEGIA

Localization

Cerebral	Brain stem	Spinal
1-Cortical : coma or convulsion 2-Subcortical 3-Capsular 99% -No coma or convulsion -UMNL 7 & 12 palsy in same side of hemiplegia	Occlusion of paramedian a Cranial N. palsy on opposite side of hemiplegia	Brown Sequard S. No cranial N. palsy

-What is the occluded vessel in capsular hemiplegia ?

- 1-Capsular branch of MCA "lenticulo striate" = artery of catastrophe (UL = LL) - Commonest cause
- 2-Capsular branch of ACA : monoplegia only
- 3-Main branch of MCA : UL > LL - aphasia is present
- 4-Main branch of ACA : LL > UL - mentality changes are present
- 5-Capsular branch of PCA : thalamic syndrome
- 6-ICA : -Ipsilateral blindness
-Absent carotid pulse : palpated in tonsillar fossa

- In hemiplegia start by examination of healthy side
- Do not examine cortical sensation on affected side in hemiplegia
- Causes of vascular hemiplegia : thrombotic -embolic -hemorrhagic (early death)

-How to differentiate organic from hysterical hemiplegia ?

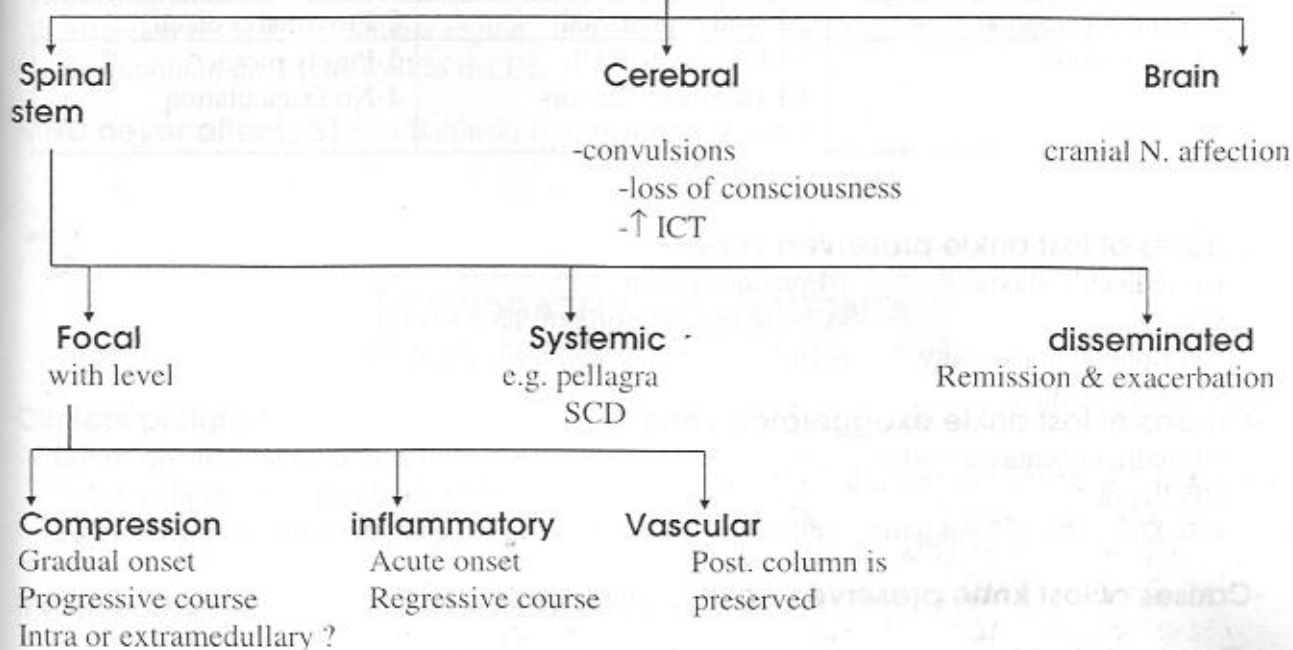
- 1-Side gait test
- 2-Babinski sign
- 3-Patient lie on his back with extended legs. Ask patient to rise up without using his hands
 - in organic spastic paralysis : affected limb will rise first
 - in hysterical lesion : non specific

-Sure signs of Δ lesion :

- 1-Babinski
- 2-Organic sustained clonus
- 3-Precipitancy
- 4-Exaggerated jaw reflex

PARAPLEGIA

Localization



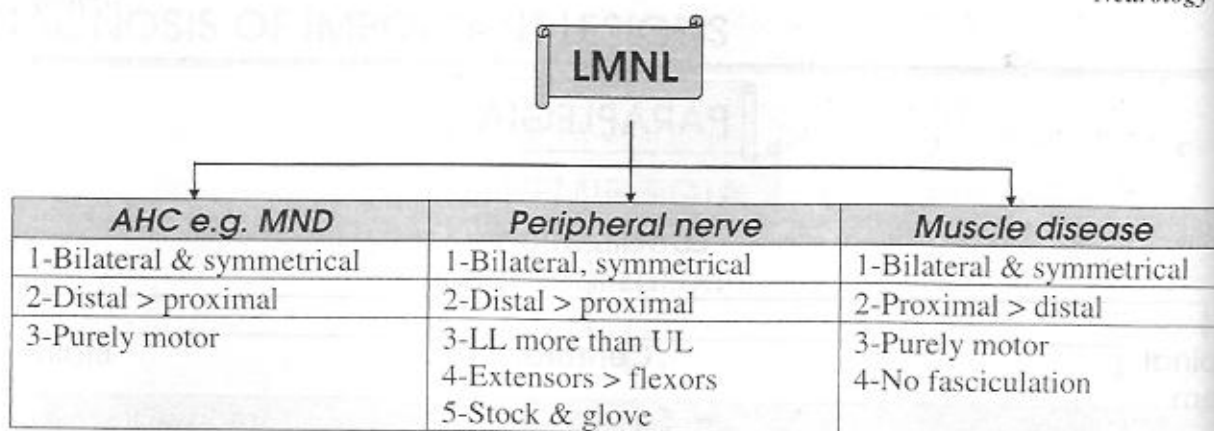
	<i>Pyramidal</i>	<i>Extrapyramidal</i>
	Antigravity muscles (mainly)	Progravity muscles (mainly)
UL	Flexors	Extensors
LL	extensors	Flexors
Trunk	Extensors	Flexors
Ankle	Planter flexion	Dorsiflexion

-Remember

- 1-Adductor muscles of UL, LL are antigravity
- 2-Only sign of pyramidal affection in shock stage is +ve Babiniski
- 3-Prolongation of shock stage is due to : UT infection - retention of urine - malnutrition
- 4-To detect paraplegia passing from extension to flexion : do Pierre-Marie foix
- 5-Level of Δ lesion by abdominal reflexes "in focal paraplegia" :
 - if totally lost $\Rightarrow$ above T6
 - if lost only in lower abdomen $\Rightarrow$ lesion above T10

-Causes of cyto-albuminous dissociation in paraplegia :

- 1-Extramedullary compression paraplegia
- 2-Transverse myelitis
- 3-Acute infective polyneuritis
- 4-DS



-Causes of lost ankle preserved knee

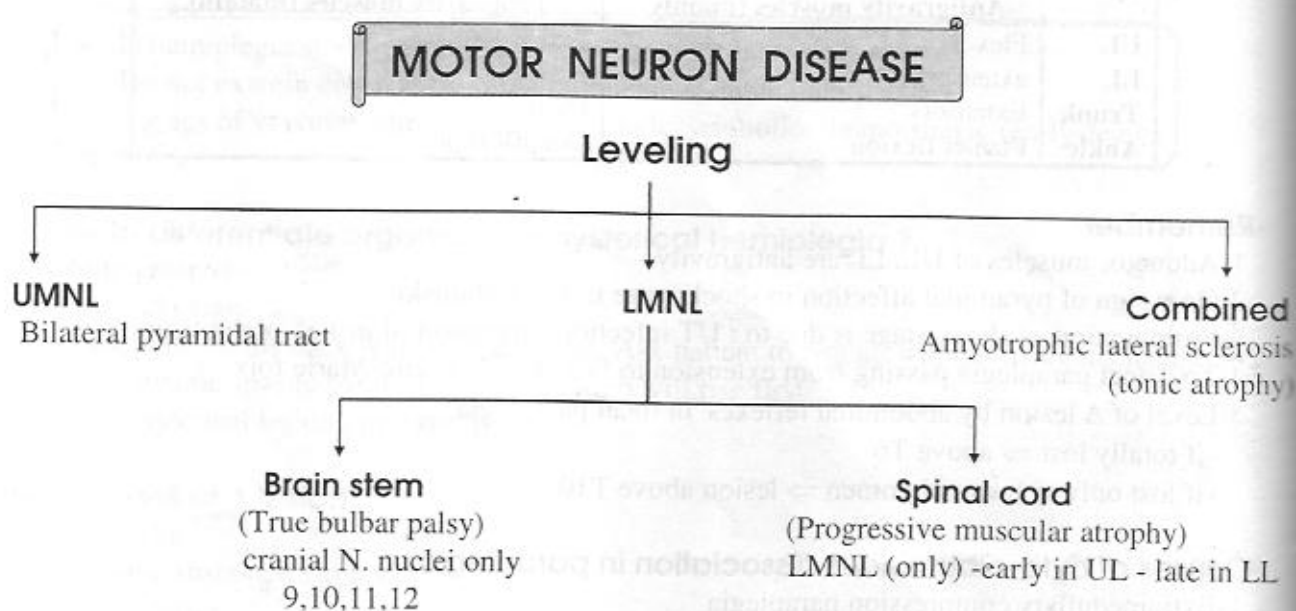
- | | |
|-------------------------|---------------------------------|
| 1-Friediech's ataxia | 4-Epiconus lesion |
| 2-SCD | 5-Cauda equina lesion of S1 |
| 3-Peripheral neuropathy | 6-Holmes - Adies myotonic pupil |

-Causes of lost ankle exaggerated knee

- 1-Friedrieich's ataxia
- 2-Pellagra
- 3-SCD

-Causes of lost knee preserved ankle : cauda equina (L2,3,4)

- Causes of lost knee exaggerated ankle : paraplegia + cauda affecting L2,3,4



Leveling of pyramidal lesion in MND

- 1-Palatal & pharyngeal reflexes : if $\uparrow$, lesion is above medulla - If normal lesion is below medulla
- 2-Jaw reflex : if $\uparrow$, lesion is above pons - if normal lesion is below pons
- 3-Mentality changes : if +ve $\Rightarrow$ lesion is above midbrain

Remember in combined MND :

- 1-Affection of AHCs of lower cervical C5-8 leads to hypotonia in UL but the LL show hypertonia due to pyramidal tract affection
- 2-Affection of AHCs of lumbar region : in addition to the above mentioned affection, leads to hypotonia in the LL as well as the UL

MND never affects S1 : so Babinski sign is -ve

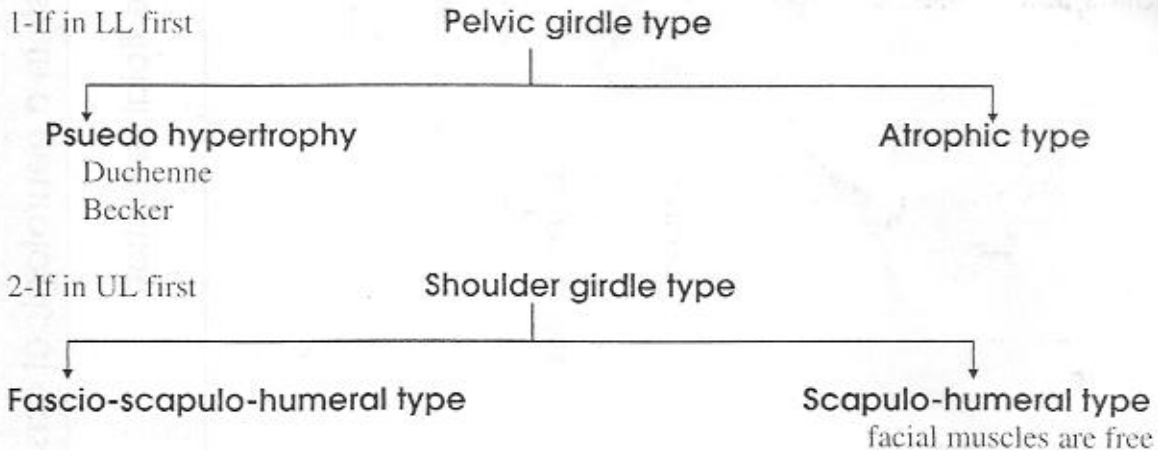
MYOPATHY & MYOTONIA

Clinical picture :

CL/P of myotonia and myopathy are the same but to differentiate between them :

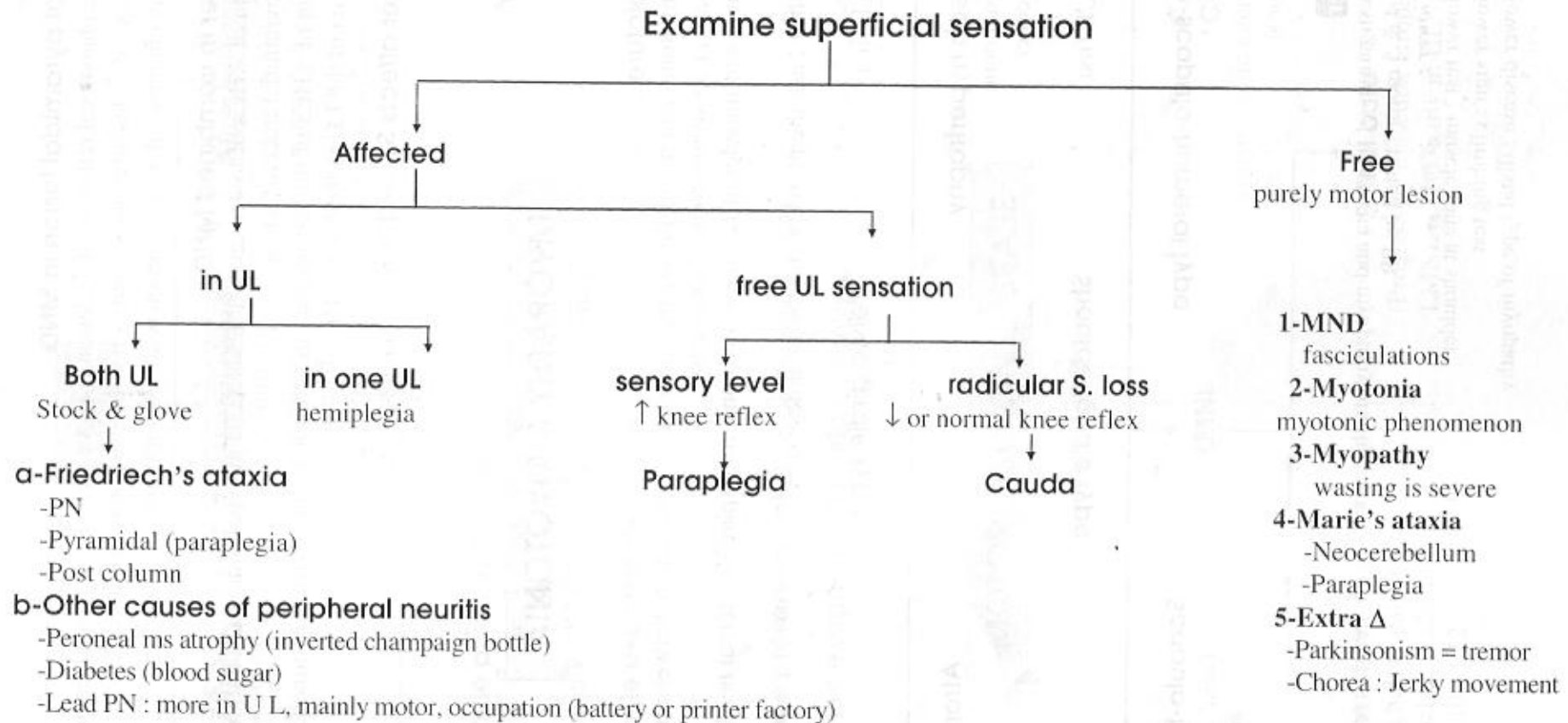
- 1-Ask patient about myotonic phenomenon
- 2-Selectivity of muscles affected e.g., myotonia may spare the sternal head of pectoralis major ms

If myopathy : ask the pt. when did the weakness start

**Remember**

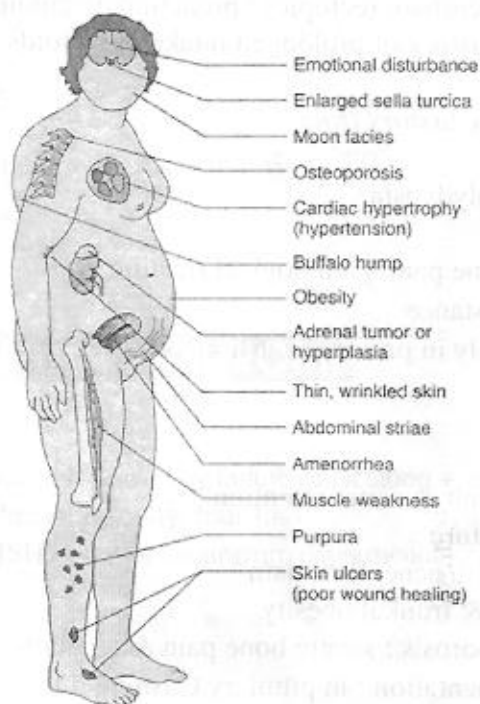
- 1-Investigations of myotonia and myopathy are the same "*see myopathy in text*"
- 2-S3, 4 & 5 motor : tested by PR
- 3- **Gower** :
 - Gower test : muscle tone at shoulder
 - Gower sign : climbing test
 - Gower disease : distal type of myopathy

How to reach diagnosis in a neurological case



6

MISCELLANEOUS CASES



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ENDOCRINAL CASES

1-CUSHING SYNDROME

ETIOLOGY :

- 1-Pituitary Cushing : $\uparrow$ ACTH leading to bilateral adrenal hyperplasia.
- 2-Adrenal Cushing : adenoma of zona fasciculata $\Rightarrow$ $\downarrow$ ACTH with atrophic other adrenal
- 3-Excess ACTH or cortisol (ectopic) : bronchial carcinoma (oat cell carcinoma)
- 4-Iatrogenic : past history of prolonged intake of steroids

HISTORY : suggestive history from

- 1-Obesity
- 2-DM : polyuria, polydipsia
- 3-Hypertension
- 4-Osteoporosis : bone pain, pathological fracture
- 5-Chest TB : $\downarrow$ resistance
- 6-Pigmentation : only in pituitary Cushing due to $\uparrow$ ACTH

EXAMINATION :

1-General :

- a-BP elevation "salt & water retention"
- b-Cushingoid feature :
 - moon face : with acne, hirsutism
 - buffalo hump & trunkal obesity
 - marked osteoporosis : severe bone pain & tenderness
- c-Increased pigmentation : in pituitary Cushing due to $\uparrow$ ACTH

2-Systematic examination :

a-Neurological :

- peripheral neuritis : superficial sensory loss, deep sensory loss (ataxia)
- visual acuity & field defect : in chromophobe adenoma
($\uparrow$ ICT due to rarely functioning chromophobe adenoma)
"basophil adenoma is microscopic"

b-Chest : full examination for infections esp. TB

c-Heart : hypertensive complications (LV enlargement $\pm$ LVF)

d-Abdomen : pot belly abdomen, gynecomastia, stria alba & rubra, fatty liver



2-ADDISON'S DISEASE

HISTORY : suggestive history from

- 1-Marked weakness, fatigue
- 2-Marked hypotension up to syncopal attack related to posture, craving for salts
- 3-Marked hypoglycemia : craving for eating especially sugar
- 4-Generalized pigmentation
- 5-GIT upset : anorexia, nausea, vomiting, diarrhea
- 6-Chest : history of TB in 2nry Addison

Complication=
"Addisonian crisis"

EXAMINATION :**1-General :**

- a-Vital signs : marked hypotension (systole never > 110)
- b-Generalized pigmentation $\Rightarrow$ dark brown
 - mucous membrane buccal cavity, tongue (slate colored)
 - pigmented area : areola
 - previous scars : umbilicus
 - friction areas : elbows, trochanter
 - sun exposed areas : face, neck

2-Chest examination : to exclude TB**3-Abdominal examination :** renal angle tenderness in miliary TB**3-SHEEHAN SYNDROME****HISTORY :** *suggestive history from*

- 1-History of labor with post partum hemorrhage followed by failure of lactation + amenorrhea
- 2-Loss of secondary sexual characters : breast atrophy, hair loss
- 3-Depigmentation of body esp. areola ($\downarrow$ MSH) - pallor occur from depigmentation & anemia
- 4-Symptoms of myxedema

EXAMINATION :**1-Vital signs :** mild hypotension**2-General :** features of myxedema**3-Systematic examination :**

- CNS : carpal tunnel syndrome - peripheral neuritis
- Cardiovascular : pericardial effusion - H block - cardiomyopathy (H failure)
- GIT : atrophy of viscera (splanchnomicria)

4-MYXOEDEMA**HISTORY :** *suggestive history from*

- 1-Intolerance to cold
- 2-Tiredness, weakness, weight gain
- 3-Slow thinking, apathy, poor memory
- 4-Constipation, dyspepsia
- 5-Genital :
 - female : menorrhagia, amenorrhea, galactorrhea
 - male : impotence, gynecomastia

EXAMINATION :

1-Vital signs :

- BP : hypertension
- Pulse : bradycardia
- Temperature : hypothermia

2-General :

a-Face :

- appearance : expressionless, bloated , yellow tinge , malar flush
- eyes : sparse hair, loss of outer 1/3 of eye brow + puffy eye lid + cataract
- mouth : thick lips, red glazed tongue

b-Skin :

- dry, cold, non sweaty , yellow, pale
- thick nail, hair is sparse

c-Weight gain

d-Thyroid gland :

- ↑ in Hashimoto, endemic goiter
- ↓ in idiopathic atrophy
- scars in previous operation

3-CNS :

- Thinking : slow cerebration, apathy, poor memory
- Speech : slurred speech, hoarse voice
- Cranial N. : nerve deafness
- Sensation : peripheral neuritis - carpal tunnel syndrome
- Motor : suspended jerk - ataxia

4-CVS :

- Sinus bradycardia
- Cardiomegaly : cardiomyopathy - cholesterol pericardial effusion

5-GIT : enlarged liver "fatty liver"



5-STUNTED GROWTH

"Dwarfism - Short stature"

Normally :

- 1-Height is measured from growth curve (it ranges between 3rd & 97th percentile of same age & sex)
- 2-Height and span are equal (proportionate)
- 3-upper segment = lower segment
 - US = distance between occiput & coccyx (or S. pubis)
 - LS = distance between coccyx & heel (floor)

Short stature "dwarfism"

- Height below 3rd percentile of normal people of their own age & sex
- Short stature + lack of sexual development = infantilism

CAUSES OF DWARFISM :**a-Chronic illness :**

- Bilharziasis
- Chronic heart disease : F4
- Chest disease : polycystic lung - chronic nephritis

b-Endocrine :

- 1-↓ growth hormone : pituitary dwarfism
 - height and body weight diminished since birth
 - body proportions are equal + normal intelligence

➤ -Pituitary infantilism : GH & gonadotrophin deficiency - as above + delicate features + small genitalia, lost 2nd sexual characters
 -Frohlich's syndrome : hypothalamic & pituitary lesion ⇒ infantilism + obesity + somnolence, diabetes insipidus, hyperphagia

- 2-↓ T4 = cretinism : mental retardation - stunted growth - disproportionate (span > height)
- 3-↑ sex hormones : precocious puberty (premature fusion of epiphysis).
- 4-↑ cortisol : Cushing syndrome or excess steroid ttt (cortisol block the ability of GH to produce somatomedin, a hepatic peptide responsible for bone growth)
- 5-↑ blood sugar : DM since childhood
- 6-Familial & constitutional : the commonest

c-Skeletal disorder :

- 1-Acquired :
 - Rickets
 - Pott's disease TB spine may end in severe kyphoscoliosis & dwarfism
- 2-Genetic :
 - a-Achondroplasia :
 - arms and legs are extremely short compared with trunk
 - face is small compared with vault of skull - sexual development normal
 - b-Osteogenesis imperfecta : bones are flattened, deformed due to repeated fractures.
 - c-Osteochondrodystrophies : dwarfism from severe affection of vertebra or ends of long bones
 - d-Turner's syndrome : dwarfism + primary amenorrhoea, webbing of neck.
 - e-Mongolism :
 - mental deficiency - narrow eye - slits which are also sloped outwards.
 - deep fissured tongue

6-ACROMEGALY

CAUSE : acidophil adenoma

HISTORY : suggestive history from

- 1-Enlargement of skull, prominent features, husky voice
- 2-Frequent change of hats, shoes, rings
- 3-Headache, blurring of vision (pressure symptoms from tumor)
- 4-DM symptoms : polyuria, polydypsia

EXAMINATION :

Vital signs : BP $\Rightarrow$ hypertension (salt & water retention + thick arteries)

General features :

- 1-Face :
 - big skull, prominent bony process + prognathism with separated teeth
 - hypertrophy of nose, ears, lips tongue
 - wrinkled skin, excess grease & sweats.
- 2-Hands & feet : enlarged with blunted tips (spade hands)
- 3-Osteoarthritis, kyphosis

Systematic examination :

- 1-CNS :
 - pressure manifestation : field of vision (bitemporal hemianopia)
 - paresthesia of hands or feet due to : thick nerves - carpal tunnel syndrome - DM
- 2-CVS : cardiomegaly $\pm$ HF
- 3-GIT : visceromegaly ($\uparrow$ liver & spleen) - gynecomastia (prolactin like)

7-DIABETES MELLITUS

HISTORY : suggestive history from :

- 1-Polyuria + nocturia
- 2-Polydypsia
- 3-Polyphagia + weight loss
- 4-Pruritis (monilia)
- 5-Pains & paresthesia : P. neuritis
- 6-Premature loosening of teeth
- 7-Blurred vision
- 8-Ask about time of development of DM : type I, type II
- 9-Ask about symptoms of other systems "complications" :
 - CNS : for P. neuritis - diabetic comas
 - CVS : for anginal pain
 - Chest : for infection esp. TB
 - GIT : inflamed gums - dyspepsia - nocturnal diarrhea - chronic cholecystitis
 - Ischemia : intermittent claudication

EXAMINATION :**Vital signs :**

- BP hypertension (early atherosclerosis)
- Pulse : peripheral pulse for ischemia

General examination : built, decubitus

Systematic examination :

- 1-CNS : peripheral neuritis - field of vision (optic neuritis) , fundus (diabetic retinopathy)
- 2-CVS : accentuated S1 (hypertension) - cardiomyopathy $\Rightarrow$ dilated enlarged heart
- 3-Chest : exclude infection esp. TB
- 4-Abdomen : fatty liver - tender Murphy's point (chronic cholecystitis)
- 5-Skin : exclude monilia infection : under breast - axilla - buttox - groin
- 6-Exclude 2nry DM (rare causes) :
 - pancreatic causes : chronic pancreatitis
 - endocrinal causes : $\uparrow$ antiinsulin e.g. Cushing, pheochromocytoma
 - others : liver cirrhosis - drugs (steroids - thiazide) - Friedreich's ataxia - Down syndrome

8-TETANY

HISTORY : suggestive history from :

- 1-Hypocalcemia : thyroid surgery (neck scar), neck irradiation - urinary loss (nephrotic syndrome)
- 2-Alkalosis : excess antacid in duodenal ulcer - repeated vomiting

EXAMINATION :

Vital signs : BP measurement ppt carpal spasm "Trousseau sign" - So Ca^{++} is given before

General :

- 1-Tests of latent tetany :
 - a-Chvostek's sign :
 - tapping over facial nerve (in front of ear) causes contraction of facial muscles
 - tapping over peroneal muscle causes contraction of peroneal ms (peroneal sign)
 - b-Trousseau's sign : $\uparrow$ BP above systolic on brachial a. for 2 min. causes carpal spasm
 - c-Erb's sign : Current < 4 milliamperes causes ms contraction (normally 8 m. Amp)
- 2-Eye : dryness $\pm$ cataract
- 3-Teeth : hypoplastic, punctate holes
- 4-Skin : dry, rough, loss of hair $\pm$ monilia infection
- 5-Nails : brittle $\pm$ striated

Multiple sites of injection are found in : 1-Addicts 2-DM 3-Tetany 4-Bronchial asthma

CNS :

- 1-Irritability, restlessness, muscle twitches, convulsions
- 2-Paresthesia around mouth

RHEUMATOLOGY CASES

1-RHEUMATOID ARTHRITIS :

- a-Arthritis of small joints of hand with morning stiffness (sparing distal IP usually)
- b-Deformity :
 - Ulnar deviation : at MP joint
 - Fusiform finger : due to swelling of proximal IP joints
 - Swan - neck deformity : flexion of terminal IP joint & hyperextension of proximal IP
 - Boutonniere deformity : flexion of proximal IP & hyperextension of terminal IP & MP joint
 - Z - deformity of thumb : flexion at MP & hyperextension of proximal IP
- c-SC nodules : appear in pressure areas (elbows, extensor surface of forearms) & in relation to tendon sheath
- d-Systemic (extraarticular manifestation) :
 - CNS : depression, neuropathy
 - Ocular : keratoconjunctivitis sicca
 - CVS : pericarditis, effusion, AR
 - Pulmonary : pleurisy, effusion , lung fibrosis
 - Renal : nephrotic syndrome
 - Hepatosplenomegaly : Felty's syndrome, Still's disease & RA amyloidosis if long standing

2-RHEUMATIC FEVER :

- Polyarticular, fleeting, affecting big joints
- Associated with other major or minor criteria of Rh. fever

3-GOUT :

- Start at MP of big toe - may affect distal IP of hand & feet
- Acute inflammation + raised serum uric acid

4-OSTEOARTHRISIS :

- Affecting weight bearing joint in limb or vertebrae
- Pain is only related to movement + coarse crepitus at joint occur
- Osteophytes (hard nodes) in distal IP (Heberden nodes) & proximal IP (Bouchard nodes) in juvenile type

5-SYSTEMIC LUPUS ERYTHEMATOSUS (SLE) :

- a-Systemic reaction : low grade fever, malaise, weight loss
- b-Musculoskeletal : arthralgia & myalgia - rheumatoid like arthritis (30 %) but no erosion .
- c-Mucocutaneous "DLE"
 - discoid lupus : maculopapular rash in butterfly area.
 - photo sensitivity
 - Others : hyperpigmentation, vitilligo, alopecia, Raynaud's phenomenon, finger ulcers
- d-Multisystem involvement : similar to Rheumatoid - in addition :
 - Diarrhea, bloody stools
 - Pancytopenia : anemia, infection, purpura
 - ↑ Liver , spleen & LN

- 6-SCLERODERMA** : “progressive systemic sclerosis” - 3 types of skin lesion
- a-Localized (morphea) : circumscribed hard waxy plaque, in forehead, sternum
 - b-Acrosclerosis : peripheral skin affection of :
 - fingers of hands & feet : swollen, shiny, limited mobility
 - face : mask face, fish mouth, telangiectasia
 - c-Progressive diffuse sclerosis : diffuse skin lesion affecting trunk, face, fingers

History :

- GIT : dysphagia, diarrhea -Skin : limited finger mobility
- Joint : arthralgia -Raynaud's phenomenon

Examination :

- 1-General :
 - a-mask face, fish mouth, wide deformed nostrils
 - b-skin: shiny, waxy, hard, adherent to underlying structure $\pm$ calcinosis, telangiectasia, ulcers & pigmentation
 - c-joint examination : swollen, tender, limited mobility.
- 2-System examination :
 - a-CVS : pericarditis, effusion - cardiomyopathy with HF - cor pulmonale (2ndry to P. hypertension)
 - b-Chest : pleurisy - aspiration pneumonia - interstitial fibrosis.
 - c-Renal : scleroderma renal crisis : malignant hypertension - CRF later on

⌘ A variant of PSS is CREST syndrome : calcinosis, Raynaud's, esophageal hypomotility, sclerodactyly & telangiectasia

SHEET FOR JOINT DISEASES

PERSONAL HISTORY :**Age :**

- Child : still's disease & rheumatic fever
- Old age : osteoarthritis
- Middle age : gout, rheumatoid, SLE

Sex : female : rheumatoid, SLE -male : ankylosing spondylitis & Reiter's syndrome

Occupation : may predispose to osteoarthritis

PRESENT HISTORY :

Onset : gradual : rheumatoid, SLE -acute : gout & rheumatic fever

Course : progressive : osteoarthritis -regressive : Rh.fever -remittent : rheumatoid & chronic gout

Duration : long : Rh. A, SLE -short : acute gout & rheumatic fever

Pattern of affection :

- Monoarticular : suppurative arthritis & hemarthrosis - gout (recurrent in big toe)
- Polyarticular : rheumatoid, SLE
- Oligoarticular : osteoarthritis
- Fleeting : rheumatic arthritis

Precipitating factors :

- Diuretics & diet : precipitate gout
- Throat infection : precipitate rheumatic fever

Description of pain :

- Site : spine lesion may cause radicular pain
- Type : morning stiffness in Rh. arthritis
- Aggravating & relieving factors :
 - in inflammatory arthritis (Rh.arthritis) : $\uparrow$ by rest & $\downarrow$ by activity
 - in mechanical arthritis (osteoarthritis) : $\downarrow$ by rest & $\uparrow$ by activity
- Diurnal variation :
 - in inflammatory arthritis : $\uparrow$ in morning & $\downarrow$ by end of day
 - in mechanical arthritis : $\downarrow$ in morning & $\uparrow$ by end of day
- Episodic arthritis : describe frequency & duration
- Associated articular symptoms : morning stiffness in Rh. arthritis
- Associated non articular symptoms :
 - multisystem complaints : Rh.A, SLE
 - skin : SLE , PSS
 - abdominal pain & fever : Familial Mediterranean Fever " FMF "
 - bleeding PR : enteropathic colitis
 - neurologic : Charcot's joint in S
 - bleeding tendency : hemarthrosis, Henoch- Shoenlein purpura

PAST HISTORY :

- Trauma : hemarthrosis, osteoarthritis
- Raynaud's phenomenon : PSS
- Psoriasis : in psoriatic arthritis
- ttt history : previous ttt & its efficacy

FAMILY HISTORY :

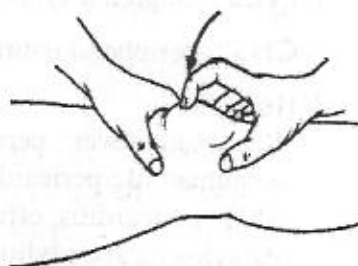
- Osteoarthritis
- Rheumatoid
- Gout
- Familial Mediterranean Fever (FMF)

EXAMINATION OF ARTHRITIS

I-JOINT EXAMINATION :

a-Inspection for :

- 1-Distribution : symmetrical peripheral polyarthropathy centripetal extension in rheumatoid
- 2-Description :
 - painful joint, swollen, red
 - range of active movement + abnormal movement (Charcot's joint)
 - overlying skin : erythema, SC nodules
 - surrounding : wasting of muscles, swelling of bursae
- 3-Deformity : Boutonniere, Swan neck
- 4-Complication : tendon rupture



Patellar tap

b-Palpation for :

1-Tenderness : at joint line (articular surface)

2-Thick synovial membrane : firm non fluctuant swelling

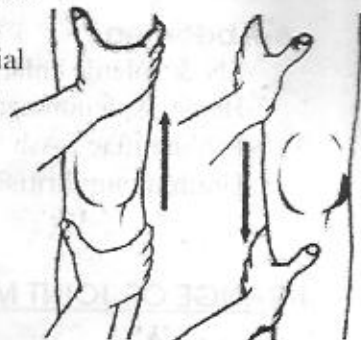
3-SC nodules : on the extensor surface of limbs, near joints & ligaments

4-Effusion : in knee joint

a-Transpatellar fluctuation test (huge)

b-Patellar tap (moderate) : with knee extended empty suprapatellar pouch "SPP", then press patella sharply against femur to produce a tapping sensation

c-Milking or massage method (minimal) : massage fluid from anteromedial "AM" space into SPP. Then firmly stroke lateral side of joint & SPP to push fluid back into AM space. Observe any fluid impulse.



Massage test

5-Movement : flexion, extension, abduction & rotation

-To detect pain & crepitus (coarse tender crepitus not fine)

-Range of movement :

-limited in Rh. arthritis

-abnormal in Charcot's joint

c-Examination of specific joints :

1-Temporomandibular : ask pt to open & close his mouth - palpate for tenderness & crepitus

2-Atlanto occipital : flexion & extension of neck (nodding)

3-Atlanto axial : turning the head right & left

4-Sacroiliac joints "back pain" : for sacroilitis

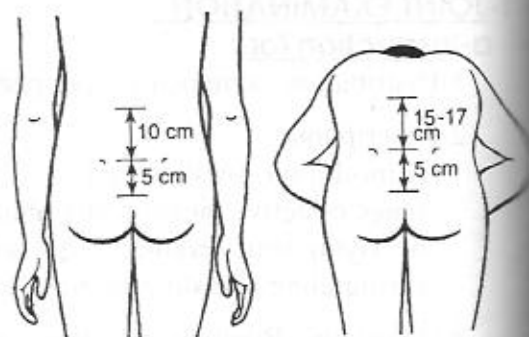
-pushing sacrum forewords while patient is lying prone

-pressing on symphysis pubis while patient is supine

-pressing backward on anterior superior iliac spine while patient is supine

5-Vertebral joints “spine” :

- Percussion for tenderness “shock tenderness” in ankylosing spondylitis
- Slight manipulation to see tenderness during movement
- Range of mobility “*Schober’s test*” :
patient, standing upright, 10 cm is measured from lumbrosacral junction . The patient is asked to bend forward maximally. Normally 10 cm should extend to 15 cm. This test can be repeated for other lumbar spines

**II-SYSTEM EXAMINATION :****1-Eyes :** Sjogren’s syndrome**2-CNS :** peripheral neuritis in Rh. arthritis - hemiparesis in SLE**3-Heart :**

- Rheumatic fever : pericarditis, pericardial effusion, heart failure, valve lesion.
- Rheumatoid : pericarditis, effusion, AR
- SLE : pericarditis, effusion, MS
- Ankylosing spondylitis : AR

4-Chest :

pleural effusion, pleurisy (rub), interstitial fibrosis, Kaplan’s syndrome (pneumoconiosis + Rh. nodules in x ray lung)

5-Skin : psoriatic arthropathy “seronegative”

affect distal IP joints (arthritis mutilans) - Psoriasis of skin extend to nail

6-Abdomen :

- LN & splenic enlargement : in Felty’s, Still’s disease , SLE
- Hepato splenomegaly & nephrotic syndrome in amyloidosis (long standing Rh. A.)
- Palpate iliac fossa for Crohn’s disease & ulcerative colitis (colitic arthropathy - seronegative)
- Urethra : urethritis in Reiter’s syndrome “seronegative”

III-RANGE OF JOINT MOVEMENT-

JOINT	MOVEMENTS
Jaw	open and shut - protrusion and retraction - side to side
Spine (cervical & thoracolumbar)	⇒ flexion & extension - lateral flexion (R + L) - rotation (R + L)
Shoulder	flexion (180) & extension (60) - abduction (180) & external rotation (60)
Elbow	flexion (150)
Wrist & forearm	flexion & extension (70) ulnar (30) & radial deviation (20) pronation (80) & supination (80)
Fingers : MP, IP	flexion (90) & extension (45) - flexion (90)
Hip	flexion(120) extension (30) abduction (45) adduction (30) internal (80) external rotation (60)
Knee	flexion (135)
Ankle & foot	plantar (5) & dorsal flexion (20) - eversion (5) & inversion (5)
Toes : MP & IP	flexion (40) & extension (4) - eversion (15) & inversion (5) -flexion (90)

GENERALIZED EDEMA

History :

- 1-Cardiac S & S
- 2-Liver cell failure S & S
- 3-Nutritional habits
- 4-History of drug intake (allergy)
- 5-Renal :
 - nephritic : acute onset, mild hematuria, (smoky urine), minimal edema
 - nephrotic : pallor, puffiness, edema : 1ry : idiopathic (child) -2nry : DM, GN, collagen diseases

Examination :

- 1-General examination & vital signs
- 2-Heart : cause or result (pericardial effusion)
- 3-Chest : infection, effusion : very important (pneumonia)
- 4-Abdomen : liver, spleen ascites

SPLENOMEGALY

Causes of Splenomegaly

- 1-Infection : Bacterial (typhoid) -Viral : viral hepatitis, IMN -Parasitic : Bilharzia, malaria
- 2-Congestive : causes of portal hypertension
- 3-Hematological :
 - anemia's : megaloblastic, hemolytic
 - hematologic malignancy, leukemia (CML), polycythemia, Hodgkin's
- 4-Neoplastic : secondaries
- 5-Infiltrative : amyloidosis
- 6-Immune collagen : SLE, Rh. arthritis (Felty's, Still's disease)
- 7-Endocrine : acromegaly, Grave's disease

Huge Splenomegaly : crossing midline - umbilicus

- 1-Infective :
 - bilharzial : history of Bilharziasis - portal hypertension evidences
 - malaria : history of fever with rigors
- 2-Congestive : severe portal hypertension (esp. Bilharzial)
- 3-Hematological :
 - thalassemia : family history - pallor, jaundice, chronic leg ulcer - hemolytic crisis (fever, rigor, dark urine)
 - CML : history of sternal puncture - anemia - bleeding tendency - bony ache & sternal tenderness
 - polycythemia vera : history of venesection - plethoric face - HF - gout - bleeding
 - myelofibrosis, lymphoma
- 4-Infiltrative : amyloidosis
 - history of chronic illness esp. suppurative syndrome
 - visceromegaly, clubbing
- 5-Collagen : Felty's syndrome of Rh. Arthritis

BLEEDING TENDENCY

1-Is there a generalized hemostatic defect ?

- a-Bleeding from multiple sites : epistaxis, hemoptysis, hematuria
- b-Skin patches : purpura - hematoma & SC ecchymosis
- c-Prolonged bleeding after laceration

2-Is the defect inherited ?

- a-Family history
- b-Bleeding dating since childhood : circumcision, tooth extraction

3-Is the bleeding suggestive of a vascular / platelet defect or coagulation defect ?

- a-Vascular / Platelet defect : spontaneous petichae (purpura)
- b-Coagulation disorders : ecchymosis, hemarthrosis, muscle hematoma on trauma

4-What is the cause ?

- a-Pancytopenia : in aplastic anemia
- b-Organ failure : liver, renal
- c-Drugs : anticoagulant

BETA THALASSAEMIA "*Thalassaemia major, Mediterranean anemia*"

Pathogenesis : HBA is markedly reduced, while fetal HB is markedly increased

- a-Excess free alpha chain : precipitate in RBC → hemolysis → anemia with marked pallor
- b-Fetal HB (excess α combine with γ chain) : HbF has high O₂ affinity → tissue hypoxia → stimulation of EPO secretion . This lead to :
 - BM hyperplasia : Mongoloid facie's
 - Extramedullary hemopoiesis : leading to huge liver & spleen (hypersplenism may occur)
- c-Iron overload : excess hemolysis & repeated blood transfusion

General Features of Hemolytic Anemia :

- 1-Symptoms and signs of anemia : pallor, hyperkinetic circulation ..
- 2-Hemolytic jaundice : lemon yellow
 - stool : dark (excess stercobilinogen)
 - urine is normal , *but darkens if* : left to stand - hemolytic crisis - pigment stones
 - gall bladder : pigment stones
 - spleen and liver enlarged
 - expansion of BM : Mongoloid facies
- 3-Chronic leg ulcers (Fe deposition under skin)
- 4-Hemosiderosis : cardiomyopathy and HF
- 5-Features of cause

6-Crisis : 3 main types

	Hemolytic crisis	Aplastic crisis (hyporegenerative)	Megaloblastic crisis
1-Cause	sudden hemolysis with excess Hb	sudden depression of BM (viral infection)	folic acid deficiency (gradual)
2-CL/P a-Anemia b-jaundice c-Others	become worse become worse fever, rigors, bone pains, abdominal pain, dark urine + anuria & shock	become worse constant symptoms of infection (pancytopenia)	mild change mild change symptoms of infection (pancytopenia)
3-Investigations a-Reticulocytes b-BM	increase erythroid hyperplasia	absent absent erythroid series	absent megaloblastic changes

GENERALIZED LYMPHADENOPATHY

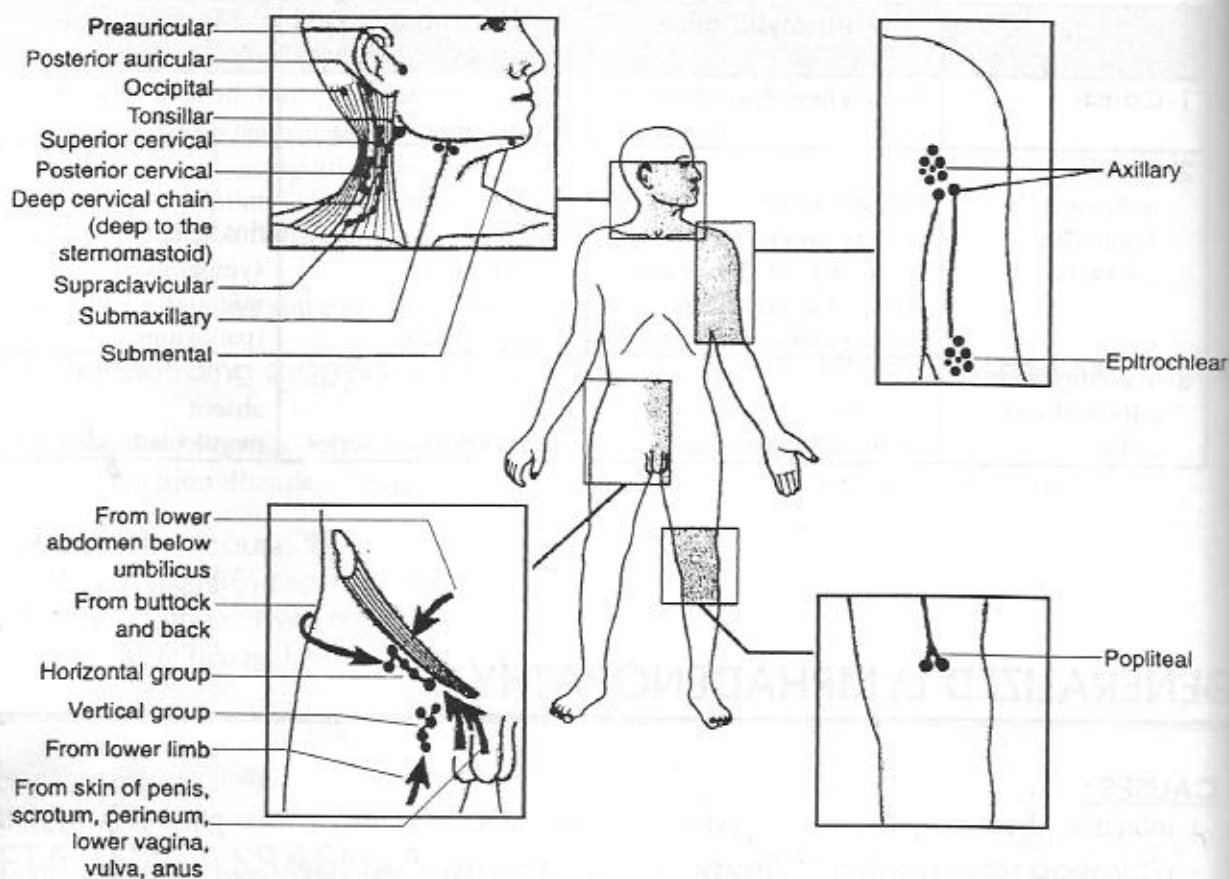
CAUSES :

- 1-Infective : Bacterial (TB) -Viral (viral hepatitis, IMN) -Protozoal (toxoplasmosis, syphilis)
- 2-Hematological malignancy : Leukemia (CLL) -Lymphoma (Hodgkin's - Lymphosarcoma)
- 3-Neoplastic : secondaries
- 4-Infiltrative : amyloidosis
- 5-Miscellaneous :
 - collagen : SLE, Felty's & Still's disease
 - sarcoidosis
 - serum sickness
 - Grave's disease
 - drugs : phenytoin

HISTORY :

- 1-Onset : acute in leukemia, gradual in CLL
- 2-Age : middle age in TB - old in CLL - Hodgkin age 18-25 y., another peak at 60 - 70 y.
- 3-Fever : Pel Ebstein in Hodgkin
- 4-TB : toxemia, anti TB, sanatorial ttt, LN biopsy (+ sinus, scar)
- 5-Leukemia : bleeding & bony pain

EXAMINATION : include LN + all systems in the body



1-LN Examination

Using your middle 3 fingers, glands are rolled up & down, back & forward in a rotatory movement

1-Cervical LN : Waldeyer ring

- Cicular group : submental - submandibular - preauricular - postauricular - occipital
- Vertical group : upper & lower deep cervical (under cover of sternomastoid)

2-Supraclavicular LN : palpated in supraclavicular fossa

- Virchow's gland : left supraclavicular LN (*suggestive of abdominal carcinoma*)
- Scalene LN : part of supraclavicular LN - They lie on scalenous anterior ms

3-Axillary LN : arm is abducted & supported on examiner forearm - These consists of

- Anterior group : behind pectoralis major
- Posterior group : on post. wall of axilla
- Lateral group : along axillary vessels
- Medial group : on chest wall
- Apical group : in the apex of axilla

4-Supra "epi" trochlear : little above medial epicondyle of humerus

5-Paraortic LN : umbilical & epigastric regions along lat. border of aorta

6-Mediastinal LN : D'espine sign in chest

7-Inguinal LN :

- Superficial group (arranged transversely)
- Deep group (arranged vertically along medial side of femoral vein)

2-Character of LN :

- TB matted - It start 1st in lower deep cervical LN
- Hodgkin : smooth, painless, rubbery, discrete. It start in deep cervical LN
- Lymphosarcoma : hard, fixed
- Syphilis & lymphoma : enlarged epitrochlear LN

3-Chest :

- TB chest : apical cavitation, pleural effusion
- Leukemia - Lymphoma : pleural effusion, pneumonia, mediastinal syndrome
- D'espine sign (see page 62) : +ve in mediastinal mass e.g. LN

4-CVS : for pericardial effusion

5-Abdomen :

- TB : peritonitis, tabes mesenterica, TB sinus of scrotum
- Leukemia : liver, spleen, ascites, para aortic LN
- Lymphoma : liver, spleen, ascites, para aortic LN

6-Neurological :

- TB : Pott's disease, anti TB drugs : PN
- Leukemia : infiltrate CNS $\Rightarrow$ paraplegia / optic N. affection
- Lymphoma : paraplegia - peripheral neuritis

7-Bleeding gums : tender sternum, purpura tonsillitis in leukemia

8-Joint affection : SLE, Rh. arthritis

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